Better Crops

The Pocket Book of Agriculture.

January 1926 10 Cents

Read: The Kingdom of the Blind—Dance Helps the Farmers—Exit Mr. Ground-hog—Early Tomatoes in the South

The New Year

January is the month of plans . . . good resolutions. Farmers are looking ahead, planning crops, figuring prices. Extension workers are in conference with farmers, with each other at their colleges of agriculture, and with fertilizer men in fertilizer schools. They are planning their main projects for a BIGGER and BETTER AGRICULTURE.

January is the month of new interest and new beginnings. Folks are still fresh with the spirit of the new year.

In line with this spirit, the men in commercal agriculture are now making their programs. We are preparing for the demands which will be made upon us—all the way from improving mining and manufacturing facilities and methods, the best arrangements for shipping and distribution, to little personal attentions.

The Potash Importing Corporation of America has a good many departments—accounting, traffic, sales, soil and crop—and they are all ready to render service to the farmer, the manufacturer, and the agricultural extension man. We want to take our part in all programs which are now being formulated for a BIGGER and BETTER AGRICULTURE.

Potash Importing Corporation of America

10 Bridge Street, New York City

Better Crops

The Pocket Book of Agriculture

The Whole Truth—Not Selected Truth

VOLUME V NUMBER FIVE

Table of Contents for January, 1926

The Kingdom of the Blind 5
Some more of Jeff's philosophy

Renovating the Farm Orchard 7
C. L. Burkholder continues his series

The Influence of Potash on Cotton Bolls and Foliage on a Potash Deficient Soil 8
By J. J. Skinner and W. F. Pate

Dance Helps the Farmer 11
A story of an ex-county agent by Dr. Guy A. Petersen

Both Ends and the Middleman 12
Arthur P. Chew finishes his discussion on marketing

Fertilizers in Alabama 14
F. E. Boyd comments on some statistics

Education—The County Agent's Life-Saver 15
A talk from experience by A. A. Burger

500 Grape Vines Earn $805.40 16
Success with grapes as told by J. Lewis Merritt

Exit Mr. Ground-hog 18
James Silver reports war on a familiar pest

400 Bushel Potato Club Elects a New Member 21
An achievement in better crops described by Hugh Fergus

Early Tomatoes in the South 22
R. B. Fairbanks in Dixie again

North Carolina Holds Fertilizer School 25
The editors sit in on special course

Keep the Orchard Fires Burning 27
V. V. Hostetler says it pays

Who's Who of BETTER CROPS

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The EDITOR'S

The Convention of Land Grant Colleges, held recently in Chicago, emphasized the need for a "forward-looking" national policy as the basis for the development of our agriculture, the industries, and home making.

In principle the evolution of such a policy will require above all things a very clear comprehension of the needs and possibilities of our national agriculture as a whole, a continuity and broad unity of purpose, yet avoiding a "sterile conformity" to mere practices, and as the program indicated, a sound policy must therefore be founded on "fundamentals."

What are the major difficulties and what are the possibilities of realizing such a **National Policy for American Agriculture?**

One difficulty is to find more of this essential time for fundamental work. A knowledge of fundamentals gives permanency. Without such knowledge a policy must be superficial, uncertain and eventually a failure. But work of a fundamental character requires time. The returns for time so spent are not immediate and never can be.

A second difficulty is the ability to comprehend the needs of our agriculture as a whole—this, we are in danger of losing. Glancing back a moment, the first State agricultural colleges founded in accordance with the Act of Congress were "especially for the sons of toil". The agriculture of the day, its problems and methods, were rooted deep in a common heritage from the land. The problems and methods of solution were relatively simple. Comprehension and unity were possible.

Speaking after 50 years of work, Dr. Gilbert on discussing the work of Rothamsted, emphasized and cited as a "prominent characteristic" of that experiment station the very close relation of the field to laboratory work and the necessity for a comprehensive view.

In the earlier days of agricultural development, a clear comprehension of the needs of the whole by one leader was more nearly possible.

But in the last two decades, conditions have changed. Under the stimulus of science applied to agriculture, economic pressures,

and other causes, our agriculture has been subdivided into many parts. The emphasis is on the specialist each speaking his own language. Though all may be working on agricultural problems, it is increasingly difficult for one specialist to understand or value the other.

The condition has produced leaders but too often of the group, the section, the part and not of the whole. Failure must be the result. How can the parts be brought together into one comprehensive unity, not only within our own national agriculture, but in its international relationship as well?

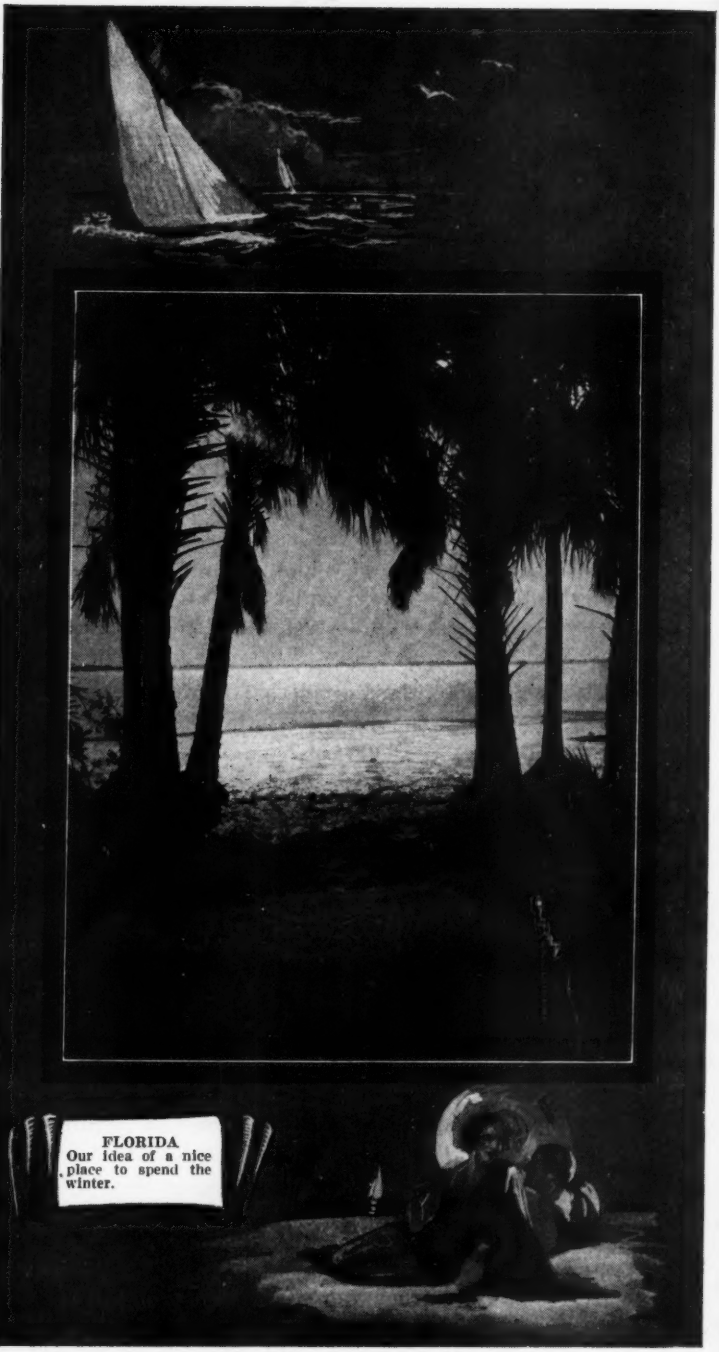
For these reasons it is particularly significant and encouraging to know that the research work made possible by funds now available under the Purnell Act and the United States Department of Agriculture has been organized by all the Agricultural Colleges and Experiment Stations on a nation-wide cooperative basis.

Managed in this way, the Purnell Act is of vital importance, not because it now gives $20,000 to every state and larger amounts next year, but because it is a valuable contribution to evolving a sound, forward-looking policy. By cooperating as a whole, a viewpoint of the whole will be developed. By avoiding duplication and doing fundamental work when it can best be done, more time for such work will be gained.

In this age an increase in funds available for agricultural work is not necessarily a blessing in itself. Their acquisition is a supreme test. The test is—can we subordinate our group, our theory of success and our leadership to the larger view of the needs of the whole? When this is possible a policy is possible.

OUR NEW YEAR BABY

With this issue, BETTER CROPS welcomes into its family circle of readers the TEACHERS OF VOCATIONAL AGRICULTURE. With a greater realization each day of the influence of young farmers on our agriculture, we feel that the aim of our publication is of value to these teachers. At all times, the editors want these new readers to feel that this is their forum—a common ground where they can work out their problems with our county agent and other agricultural extension readers.


FLORIDA
Our idea of a nice place to spend the winter.

PUBLISHED MONTHLY BY THE BETTER CROPS PUBLISHING CORPORATION, A SUBSIDIARY OF THE POTASH IMPORTING CORPORATION OF AMERICA, 10 BRIDGE STREET, NEW YORK. SUBSCRIPTION, $0.50 PER YEAR; 10c PER COPY. COPYRIGHT, 1925, BY THE BETTER CROPS PUBLISHING CORPORATION, NEW YORK.

VOL. V NEW YORK, JANUARY, 1926 No. 5

¶The beginning of the year is a good time to test your mind's eye on this chart which Jeff calls—

The KINGDOM of the BLIND

By Jeff McDermid

A MAN took ten dollars away from me last night so easily that I am ashamed to tell of it.

In fact, I wouldn't publish the details now except I am sure that in the story lies a moral which fits this season—the beginning of a new year.

We were talking, this man and I, about Russell Conwell, who made a fortune from his lecture "Acres of Diamonds," the lecture which tells the narrative of the discontented fellow who left home, travelled around the world to hunt his fortune, only to return sad, disillusioned and penniless to find that in his own back yard others had discovered acres of diamonds!

I remarked how few of us are really alive to the opportunities around us, and how Conwell, in

his own life, had been able to clearly perceive his own opportunities.

Then this man said: "The trouble is, that most men *look,* but do not *see;* they become blind to the very things that represent their main chance. That is why often an inexperienced chap from the outside can drop casually in and point out to a captain of industry chances for profit that had been entirely overlooked."

"We are, most of us, so close to the pickets that we cannot see the fence," he went on.

AND then he sprung the game on me that cost me ten dollars, taught me a great lesson and gave me the stimulus for this story.

He said: "By the way, speaking of inability to see, how many times do you estimate that you have looked at that watch you carry?"

"I have had it twelve years," I replied; "I presume five times a day would be a conservative estimate; five times three-sixty-five—let's see—eighteen hundred. Times twelve years—say about twenty thousand times. Why?"

"You have lifted that watch from your pocket twenty thousand times to peer into its face—by your own too conservative estimate. You're too low—but let that pass."

"I'll wager you cannot tell me whether your watch has a Roman numeral six or a regular figure six! I say that you cannot tell me now, after looking at the watch five times a day for twelve years, whether the six is a 'VI' or a '6.'"

I pondered a moment.

"I'll take your wager!" I exclaimed, for suddenly I knew that the "two" on my watch was a "II," and the four a "IV."

"My watch has a 'VI' for its six," I announced solemnly, my mental fingers already on the easily won money. "Let's make it ten dollars," I proposed.

"Good," he said, "I accept."

I pulled out the watch. My face fell. I looked at him sheepishly. *My watch, in common with most other watches, had no six whatever.*

"IN the Kingdom of the Blind, the One-Eyed is King!"

Most men can look, but few can see. *Looking* means but to open the eyes and let nature do the rest, but to *see* means to concentrate the gaze with an understanding eye—to see not only the thing itself but its background—the history behind it; its true relation to other things; and its calculated future.

With so few men able to look and actually see what they look at, it is small wonder that certain clever men have been able to dominate, to intrench themselves so thoroughly that nothing now can dislodge them. These men *see* what they *see.* They look—and understand. Their gaze takes in fully what is there and their mind supplies the rest.

Most men are mentally blind and because this is so those who can even partially see the "acres of diamonds" in their back yards are easily King, though even the best is but one-eyed mentally.

As we look over the great inventions and great discoveries of the world, we cannot but be startled with their simplicity when viewed in retrospect.

Take Ike Newton and his apple, for example.

For unnumbered generations men had watched apples falling.

(*Turn to page* 61)

¶This is the second of Professor Burkholder's practical series.

RENOVATING *the* Farm ORCHARD

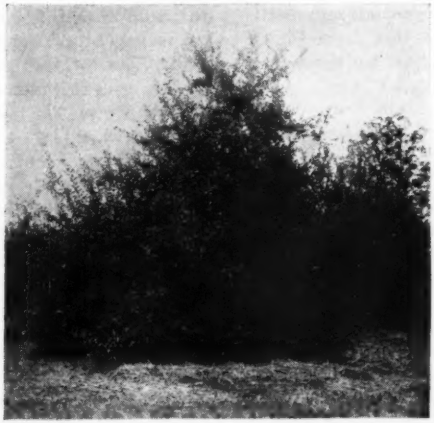
By C. L. Burkholder

Purdue University, Lafayette, Indiana

NO successful farmer expects to produce crop after crop from the same soil without returning plant food to the ground as a just recompense for such returns.

Somehow these same people often forget that a crop of even wormy, diseased apples removes about eighty-six pounds of plant food to the acre while crops such as corn remove only ninety-two pounds, and wheat forty-five pounds. It is a well established belief that the farm orchard cannot be expected to produce more than every other year. Why?

It is true that old trees of some varieties such as Baldwin, White Pippin and Wagoner seldom can be kept in a vigorous enough condition to crop annually. On the other hand most varieties will produce at least a partial crop every year if they are well supplied with plant food and water.



Mulching with straw saves cultivation during busy summer season

The blooming process on an apple tree uses up a great deal of the stored energy of the tree and unfortunately an apple tree produces the fruit buds for the next

(*Turn to page* 54)

The *Influence* of POTASH on COTTON Bolls AND Foliage on a Potash Deficient Soil[1]

By J. J. *Skinner and* W. F. *Pate*[2]

¶*Reprinted from the September Journal of the American Society of Agronomy.*

THE results secured in a fertilizer experiment with cotton on a Coastal Plain soil which was formed from Piedmont material transported and deposited by stream action show striking needs of the soil for certain plant food materials for cotton production and the influence of certain fertilizer elements on the character of the cotton plant and the fiber produced.

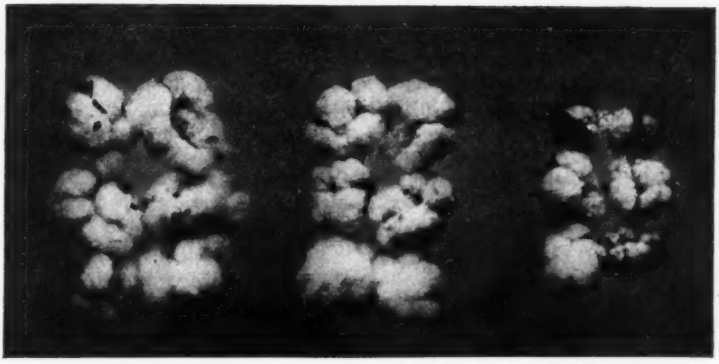
The experiment cited was made on the Wickham fine sandy loam near the Cape Fear River at Fayetteville, North Carolina, in 1923, was repeated in 1924, and is one of a large group of fertilizer experiments on the principal soil types in the cotton belt.

The soil consists of a light brown or yellowish brown fine sandy loam to a depth of 10 to 12 inches, while the surface 2 to 5 inches is a gray to yellowish gray. It is underlain by a yellowish brown to light brown fine sandy loam, extending from 12 to 15 inches in depth and this passes abruptly into a yellowish red, heavy, stiff, but friable sandy clay. The chemical analysis of a composite sample representing the Wickham fine sandy loam of this area shows the surface soil to contain 0.028 per cent nitrogen, 0.033 per cent phosphoric acid, 0.748 per cent potash, and 0.432 per cent calcium. The analysis of a composite sample of soil taken from the experiment area before the experiment was inaugurated showed the surface soil to contain 0.0736 per cent phosphoric acid, 0.75 per cent potash, and 0.35 per cent calcium. The subsoil contained 0.062 per cent phosphoric acid, 0.93 per cent potash, and 0.29 per cent calcium.

THE experiment with cotton was made on a uniform field on plats 1/18 acre in size. Twenty-

[1] *Contribution from Office of Soil Fertility Investigations, Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C., and Department of Agronomy, North Carolina Agricultural Experiment Station, Raleigh, N. C., cooperating. Received for publication May 20, 1925.*

[2] *Biochemist, U. S. Department of Agriculture, and Professor of Soils, N. C. Agr. Exp. Sta., respectively.*



1 2 3

Fig. 1.—*Open cotton bolls from* 3 *plots of the fertilizer experiment on Wickham fine sandy loam*
1, *from plat fertilized with* 900 *pounds per acre of a* 9% *potash fertilizer.*
2, *from plat fertilized with* 900 *pounds per acre of a* 6% *potash fertilizer.*
3, *from plat fertilized with* 900 *pounds per acre of a no potash fertilizer.*

one fertilizers were used, the plan of the experiment being based on the trinagle system of fertilizer experimentation.[1] Acid phosphate, nitrogen, and potash were used singly and in combination of two and of three of the fertilizer constituents. There were four mixtures of phosphoric acid and nitrogen, four of nitrogen and potash, four of phosphoric acid and potash, and six mixtures containing all three fertilizer ingredients, the ratio of P_2O_5, NH_3, and K_2O varying in the mixtures in 3 per cent stages. The plan of the experiment is such as to show the needs for the soil of any of the fertilizer constituents or combination of fertilizer constituents. The source of P_2O_5 in the fertilizer was acid phosphate, the source of K_2O was potassium sulfate, the source of NH_3 was one-third from sodium nitrate, one-third from ammonium sulfate, and one-third from cottonseed meal. The fertilizers were applied in early spring before the seed was planted and were used at the rate of 900 pounds per acre. Wanamaker's Cleveland cotton was grown in 1923 and Mexican big boll in 1924. The fertilizer treatments together with the yields are given in Table 1.

During the early season there developed a considerable difference in the growth of the plants in the variously fertilized plats. During the early growth and throughout the entire season the plants on the plats receiving fertilizers containing no nitrogen made a slow growth and produced a small stalk, and those receiving mixtures containing nitrogen produced an early vigorous growth and a normal size stalk which is characteristic of the effect of nitrogen on cotton on most soils. However, the plants on the plats receiving phosphate alone, nitrogen alone, or mixtures of phosphate and nitrogen developed abnormal characteristics in July, which became very marked by early August. An abnormal dark green color developed, and many of the leaves of the plants became crinkled. This character-

[1] *Schreiner, O., and Skinner, J. J. The triangle system of fertilizer experiments In Jour. Amer. Soc. Agron.,* 10:225. 1918.

istic was especially noticeable in the plants on the plats containing high proportions of nitrogen. This unusual color and crinkling effect on the foliage was not apparent in the plats receiving fertilizers containing potash, nor did any abnormal physiological disturbance appear in the potash plats. There was no apparent difference in the blossoming and fruiting of these variously fertilized plats at that time. Later in August the crinkled leaves of the plants on the no-potash plats became bronzed and rust appeared, which resulted in early maturing and shedding of the foliage and a cessation of fruiting.

WHEN the cotton was picked on September 21, there was a marked difference in the size of the bolls on the potash and no-potash plats. The bolls on the potash plats were large and the burs opened normally, while those on the no-potash plats were small and apparently opened before reaching full maturity. The burs did not open wide and the cotton clung tight.

A photograph made on September 21, 1923, the time of the first picking of the cotton, is shown in Fig. 3. Figure 4 shows the cotton fertilized with a mixture containing 6 per cent P_2O_5, 3 per cent NH_3, and 6 per cent K_2O, and Fig. 3, cotton fertilized with a mixture containing no potash and a high proportion of ammonia. The formula used here is 6-9-0. It should be noted that the plants in the plats which received the potash fertilizer still carry their leaves and the cotton is fluffy, while that receiving the no-potash fertilizer has shed its leaves and the bolls are small and poorly opened. The complete fertilizer plat gave at this early picking a yield of 774 pounds of seed cotton per acre against 612 pounds for the no-potash plat.

The rust or potash hunger characteristic is noted in Fig. 2, which shows the field as it appeared at the time of the final picking on October 25. The cotton on the left received a fertilizer containing 9 per cent P_2O_5, 3 per cent NH_3, and 3 per cent K_2O, and that on the right a mixture containing 9 per cent P_2O_5, 6 per cent NH_3, and no potash. The generally defoliated plants with small partly opened bolls are shown on the no-potash plat. On this and the other no-potash plats in the experiment, especially the plats fertilized with mixtures high in ammonia and no potash the pickers complained of difficulty in picking the cotton on account of the cotton sticking in the burs and the burs not being open as wide as on the other plats.

In Fig. 1 cotton bolls picked from several of the plats in the experiment are shown. Those shown as No. 1 are from the plat fertilized with 900 pounds per acre of a 9 per cent potash fertilizer; No. 2 from the plat fertilized with a 6 per cent potash fertilizer; and No. 3 from the plat fertilized with a no-potash fertilizer. The character of the cotton grown with the different fertilizers is interesting and the differences are very marked.

The experiment was repeated in 1924, the same fertilizers being used on identical rows as was done in 1923. Mexican big boll cotton was grown instead of the Cleveland. The growth and fruiting characteristics were the same as observed in 1923, except that the differences occuring in the differently fertilized plats were even more marked and the foliage and boll characteristics were accentuated.

(*Turn to page* 43)

DANCE Helps the Farmers

By Dr. Guy A. Peterson

Madison, Wisconsin

¶Every Community ought to have this kind of Dance.

JAMES DANCE, former county agent in Waupaca county, Wisconsin and present president of the Central Wisconsin Seed Company, is still giving the farmers the same kind of information and services that he gave them when he was county agent.

Since this county has been without an agent for about two years, many farmers have availed themselves of the services offered by the seed company. "We believe it pays us to help the farmers, for by so doing we are helping ourselves," says Dance.

Dance maintains that Waupaca county, with its sandy loam soil that is quick maturing and readily responsive to small amounts of fertilizer, will prove to be an ideal place for growing seed corn, because corn will get ripe there in almost any season.

He says that in the fall of 1924 when seed corn was scarce in many communities, a considerable number of farmers in the neighborhood of Waupaca had as much as a hundred bushels of good, dry seed corn that would germinate practically 100 per cent.

The company intends to develop their seed corn growing on the same basis as most sweet corn factories develop theirs. They will contract for the seed corn, weigh it up when the farmer brings it in, and pay him for it by the ton. It will then be hung and dried in the kiln drying rooms until ready for shelling. It is not shelled before spring, when it is tested, tipped,

(*Turn to page* 47)

Finishing the discussion started last month.

Both Ends and THE MIDDLEMAN

By

Arthur P. Chew

United States Department of Agriculture

MANY retail dealers lose money because there are too many retail shops in their neighborhood. Competition forces their prices below the profit level, in spite of all they can do toward keeping operating expenses down.

In a little Wisconsin village of 1,000 people one meat market served the people and the proprietor seemed successful. But when another store was opened, both lost money. It has been found, indeed, that it takes about 1,000 people to support one retail meat store. In one city where there was one meat store to 835 people, three out of every four stores were found to be losing money.

There are thousands of meat stores in the country that haven't enough population in their neighborhood to support them profitably. This is a difficulty that the dealers can not control. Another difficulty, only partially controllable, is too high running expense. Many stores do just a little more business than one man can handle and less than two can handle. When there are two men in such stores, they nearly always run at a loss.

Similar illustrations of apparently remediable waste in distribution could be given from other lines of business. Enough has been said, however, to show that retailing is a big factor in widening the spread between the city and the country price of farm products. But it is by no means the only cause of the trouble. Trucking costs, railroad switching and floating, pier station handling, loading and unloading, credit and delivery service, and purchase in small lots by housewives add to the cost of distribution.

In New York about 25 per cent of the trucking charge for handling fruits and vegetables is attributed to idle time occasioned by the use of out-of-date facilities. It costs more to truck a sack of potatoes 10 miles in New York than to haul it by freight 1,000 miles from Michigan. Terminal conges-

Congestion in South Water Street, Chicago, costs consumers an enormous sum

tion is a cause of waste and extra expense in distribution in most of our large cities.

Another cause of high distribution costs is shrinkage and deterioration of perishables, as a result of inefficient marketing. Gluts in one place while at the same time there are shortages at other nearby places are a common occurrence. There is no doubt at all as to the crying need for more efficient distribution; the only question is whether the means to supply that need are available.

NO one thing can remove all the causes of too high distribution costs. They are too many and varied. Cooperation, however, seems likely to do its share, judging by the progress it has made in the last 10 years. I have referred to cooperation as an experimental method of determining whether distribution costs are too high.

Usually, it assumes they are, plunges in to find out, and settles the problem one way or the other by its own records of profit and loss on the undertaking. Generally, it appears, the hunch on which the cooperatives proceed is right. At least that seems a reasonable inference from the fact that cooperative business done by farmers' organizations in the United States increased from $635,838,684 in 1915 to $2,200,000,000 in 1923.

Success is the only word that explains that sort of a jump. Farmers organized cooperatively are finding that they can do the job of assembling and distributing the products of the soil better and cheaper than it has been done before. That is why there were 10,160 cooperative associations in the United States two years ago, compared with 5,524 in 1915.

It should be noted that the growth in the volume of cooperative business is a better measure of the success of the cooperative

(*Turn to page* 49)

Fertilizers In ALABAMA

By F. E. Boyd

Agronomist Alabama Polytechnic Institute, Auburn, Alabama

DURING the three-year period 1923 to 1925 the Agronomy Department of the Alabama Extension Service in cooperation with the fertilizer division of the State Department of Agriculture and fertilizer manufacturers and distributers made a careful study of the kind and amount of fertilizers used in each Alabama county.

The compilation for 1923 was never completed in detail. The results of the 1924 study were published in the December 15, 1924, issue of the Alabama Farm Bureau News. Based on the number of tax tags sold during the 1924-25 season the State of Alabama used 579,622 tons of fertilizers of all kinds. An analysis of this tonnage has just been completed, the results of which are given in the accompanying table.

In this study we are unable to determine the formula for 71,219 tons and could not find any record as to the distribution of 70,961 tons. This "unaccounted for" tonnage is probably made up of small shipments for which no shipping record is required, tonnage hauled by wagon and unused tax tags. A good part of this tonnage may be assigned to territory in which are located large fertilizer factories that deliver a considerable tonnage to wagons.

A complete analysis of the data shows that the total tonnage is represented in 76 different materials and formulas but 14 of this number representing only 59 tons were grouped together in the "miscellaneous" column.

Taking the State as a whole these data are quite accurate and give a very good idea as to the kind and amount of materials and mixed goods used by Alabama farmers.

A further study reveals the fact that 49.5 per cent of the total tonnage is composed of separate ingredients or materials and that 42 per cent is made up of complete fertilizers containing 16 per cent plant food, the minimum required by the Alabama fertilizer law. The remaining 8.5 per cent of the total is mixed fertilizers with the plant food content varying from 17 to 25 per cent.

(*Turn to page* 54)

The sick soil as it looked before it was treated to a dose of "education"

Education--The County Agent's *Life-Saver*

By A. A. Burger

Ex-County Agent, Iowa

¶An "Old Hand" talks out of his experience on the value of keeping ahead of the game.

EDUCATIONAL projects are the foundation of all successful county agent work.

It is natural that this should be so for the authors of the Smith-Lever law which made provisions for its support, had this thought in mind when the bill was on its passage in Congress. From the very nature of the work it is essentially a part of a great extension organization, reaching down from the federal government, through the state extension departments, ultimately through the county agents in the various counties of the country, to the people. It is one of the greatest forward steps in agricultural educational work ever undertaken by the government. Its results have fully justified its establishment and more than that, its growth and accomplishment have far surpassed the fondest hopes of its authors.

I do not want to be misunderstood. There are, to be sure, many other legitimate lines of work that the county agent may take up, and many of them have been demanded by the people. A great many of these have been very successful. Some of them have failed. Where they have

(*Turn to page* 51)

¶Prohibition is no problem for this grower of quality fruit.

500 Grape

COMMERCIALLY, the grape industry in South Carolina at present is confined largely to express shipments. Until a few years ago, practically no attention was given to this delicious fruit other than the planting of a few vines for home use.

Several vineyards have been planted in the state recently with the idea of supplying the demand of local and nearby markets for table grapes. As the industry increases, markets other than local will have to be found. This problem is already being solved by several of the enterprising farmers in this state who are raising grapes on a commercial scale.

A notable example of good work that is being done along this line is found on the farm of A. D. Atkinson and his son F. W. Atkinson. In 1924 the Atkinsons made a profit of $624.75 on their acre of grapes in Aiken County. The exact number of vines on this acre numbered 500 and the gross sales amounted to $805.40, which is an outstanding record of production for the second growing year of the vineyard.

However, the Atkinsons are not only producing good yields of grapes on one acre of average Coastal Plain land—but what's more—they are selling them. F. A. Atkinson, who is the manager of the vineyard, started out on the right foot by building up his market on a quality product. And as a result where he found it hard to sell 1,000 pounds of grapes the first year, he could have sold grapes from 10 acres on the same market the third year, according to his statement.

The writer recently visited the Atkinsons' farm and got a first hand account from F. W. Atkinson. As Mr. Atkinson keeps accurate records of his grape vineyard he had no trouble in backing up his story. And it is a story to which every Palmetto farmer who wants to engage in a profitable side line should listen.

The farm consists of 315 acres with about 150 acres under cultivation and is a typical Coastal Plain farm such as is found in most of the South Atlantic states. Beech Island is the name given to this particular section of the Sand Hills.

Mr. F. W. Atkinson, who has charge of the vineyard and the home orchard, started his account of how he managed to make grapes a profitable enterprise with the following statement: "It was after the boll weevil hit us hard that I began to look around for some crop to supplement cotton

Vines Earn $805.40

By

J. Lewis Merritt

Clemson College, South Carolina

and the general farm crops. At first I tried out several crops that looked good on paper, but none of them suited me. Finally through a suggestion of the Extension Horticulturist of Clemson Agricultural College, I decided to try grapes on a small scale. And I would advise all beginners to start out on a small scale, the average size of the grape vineyard for average farms should be 1 or 2 acres. In my own case I found it better to 'grow' into the business, rather than 'go' into the proposition on a large scale at first.

"After inquiring around the neighborhood I found that grapes had been tried by some farmers 40 years before, but that they proved to be a failure. However,

(*Turn to page* 58)

County Agent C. L. Gowan and A. D. Atkinson inspecting grapes in Atkinson's vineyard

¶If a woodchuck would chuck only wood, this war might not have been waged.

EXIT

GROUND-HOGS have increased in numbers in the Eastern States during the past few years and have considerably extended their range. In counties where they were an object of curiosity or entirely absent a few years ago, they have to-day become a menace to crops. There has also been a noticeable change in their habits, probably due to the more intensive cultivation of farming lands.

These animals at one time were seldom noticed out of the fields, but were seen close to patches of woods, fence rows, rock piles, brier thickets, and in similar situations. Although many may still be found in such places, ever increasing numbers are digging their burrows far from such protection and usually in places where their presence represents a loss to the farmer.

Ground-hog-Woodchuck or Marmot

Ground-hogs are particularly fond of leguminous crops and move their residence from place to place to keep within easy access of the soybean or the clover field as these crops are rotated. They travel also farther from their dens than is generally suspected, although they usually manage to keep open a number of otherwise unused holes in order to make a quick get-away from their enemies. They have been observed as far as a half-mile away from any den, probably in search of a new home or a more favorable field for their operations.

A number of introductory demonstrations and country-wide campaigns to reduce the numbers of these animals have been conducted in agricultural communities of Indiana and Illinois by the Biological Survey of the United States Department of Agriculture. These

Mr. Ground Hog

By

James Silver

United States Department of Agriculture

demonstrations aroused surprising interest and showed that farmers recognize the ground-hog, or woodchuck, as a destructive pest and an intolerable nuisance.

As a result of the interest manifest, the Biological Survey assigned a specialist in rodent control to cooperate with the extension services of these two States and later a second expert was assigned to New York State.

As a basis for a schedule of demonstrations, a circular letter questionnaire was sent to county agents of Indiana and New York asking whether rodent pests were of importance in the county and assistance needed in the solution of problems arising. The replies indicated that animal pests generally and ground-hogs in particular were of considerably more importance than had been realized before.

Of the 72 counties in Indiana replying to this letter, 46 definitely requested demonstrations or other types of assistance in rodent control. This was 64 per cent at first notice, but that was a year ago and it has been significant that during June of this year (1925) more than half of the Indiana counties in which ground-hog demonstrations were held on request were counties that had previously reported ground-hogs as "non-important, no assistance needed."

The demand for rodent-control work in Illinois has been fully as great and operations during the past year have been nearly equally divided between the two states.

In New York, the first questionnaire was concerned primarily with the scheduling of woodchuck demonstrations and resulted in arrangements for 203 demonstrations in 51 counties. Most of the county agents who scheduled ground-hog demonstrations during the farmer's busy season did so with misgiving, but almost without exception they were surprised at the large turnout.

Of the 92 demonstrations conducted in 24 counties in Indiana, farmers to the number of more than 2,100 attended, and averaged about 23 at each demonstration.

That these demonstrations resulted satisfactorily, is indicated also by the fact that 20,000 pounds of calcium cyanide, the fumigant

recommended for use in destroying the pests were sold in Indiana. Much zest was added to the demonstrations by having the assembled farmers dig out one or more burrows, to capture the ground-hogs and show the immediate action of the calcium cyanide.

Considerable work is involved in digging out some of the burrows and there is no definite assurance in most cases that the burrow will be occupied at the time, so some apprehension was felt as to how the farmers would respond. It was soon evident, however, that they get a real "kick" out of it. It was sport for them as well as an opportunity to joke one another about their digging ability.

It also proved very instructive since only a very small proportion had seen a burrow excavated. More important still, by actually seeing the recommended product do the work in less than a minute, they were won over at once to the method, so that the demonstrations proved unusually effective.

As an illustration of the rapidity with which the recommended methods found favor, four counties, two in Indiana and two in Illinois, that had been paying bounties on ground-hogs, appropriated funds for the purchase of calcium cyanide in quantity for free distribution to the farmers, in place of paying out money under the old bounty system which had failed to stop the increase of the pest.

Mercer County, Illinois, is one that has been paying a bounty on ground-hogs and that now realizes the futility of this system. Five years ago this county paid out $500 at the rate of 25 cents for each ground-hog. In spite of this drain on the numbers of the pests ground-hogs increased steadily until last year the bounties paid at the same rate amounted to $3,000.

This year the county appropriated $1,200 for the purchase of calcium cyanide as recommended, and a series of demonstrations was arranged. As a result the infestation has been greatly reduced.

The effective control of ground-hogs becomes a problem of larger scope than clearing individual farms, because of the migratory habits of the animals. County-wide campaigns for the control of the ground-hog seem to meet this larger need.

Game wardens digging for ground-hog information

400 BUSHEL Potato CLUB *Elects* a New Member

By *Hugh Fergus*

TOM DENNISTON has been going to school for the past 10 years.

This is not an ordinary school Tom has been attending but one where potatoes are the main theme. Tom has been both teacher and pupil.

The past two or three years his boys have been members of this same school and this year Denniston and Sons have graduated from this school of experience by achieving the highest honors that can come to a Pennsylvania potato grower, namely, membership in the 400-Bushel Potato Club of the state.

Even though they have reached this coveted honor they feel that they can still learn a few wrinkles in the potato business and even though they had just harvested and marketed the crop when I visited them, they were already laying plans for a better crop next year and a larger acreage.

A few years ago the Pennsylvania State College hired a potato specialist, Dr. Nixon, to do extension work over the state among the potato growers. By lectures, articles in the farm press that reached the farmers of the state, and working through the county agents, he has in a short time brought Pennsylvania from twenty-seventh to seventh among the potato-growing states.

For example, in the county where the Dennistons live, if you had asked a potato grower five years ago if he were using certified seed, he would have looked at you questioningly and asked you what you meant. Now this county annually plants about 10 carloads that are ordered through the Farm Bureau in addition to those ordered privately through seed houses.

About four years ago, in order to add stimulus to the growers who were making good yields, Dr. Nixon organized the 400-Bushel Potato Club. To attain membership in it a grower must grow 400 bushels or more on one acre to be dug under official supervision. Along with it he must keep and turn in to the State College an accurate record of all the work and expense of growing.

TEN years ago Mr. Denniston began growing potatoes as a cash

(*Turn to page* 60)

Early TOMATOES

¶Dixie meets another demand from northern markets.

THE growing of early tomatoes for the northern and eastern markets in several of the southern states has reached tremendous proportions.

The yearly output runs well up into the thousands of cars, Mississippi alone shipping around 2,000. Florida, of course, is the leader in the production of very early tomatoes, these being shipped from midwinter up to early summer. Texas is a large producer of these early tomatoes; also west Tennessee and to a lesser extent southern South Carolina and Georgia.

There seems to be an ever-increasing demand for the southern-grown early tomatoes on the part of northern and eastern consumers. Ten or 15 years ago the market for this crop was not nearly so great as at present.

It seems that the increased demand is due not only to the ever-increasing population of the larger cities in the north and east, but to the increased consumption per person. This, of course, is brought about by the increased desire for this fresh fruit on the part of both rich and poor.

"Where the red tomatoes twine"

Another reason for the increased consumption of this early vegetable is that most of it goes out now as green-wrapped instead of pink. Until a few years ago practically all of the early tomatoes were picked and shipped in what is

in The SOUTH

By R. B. *Fairbanks*

known as the pink stage, or just after ripening started. This, of course, meant that they had to be consumed in a very short time.

Now a very large percentage of the early tomatoes shipped from the South go out as green-wrapped. These are picked when the tomatoes are fully mature and when the green color begins to show a whitish cast. They are wrapped in tissue paper, and shipped in refrigerator cars.

When handled in this way, they usually reach the distant markets just about the time the pink or ripening color begins to show up, and so the time over which they can be marketed in the shops is prolonged considerably.

To get this fruit on the market as early as possible, the plants are grown in hotbeds.. In the tomato-growing regions of Texas, Central Mississippi and West Tennessee, where most of the crop outside of Florida is grown in the South, the seed are sown from December 15 to middle or latter part of January. Of course, in Florida the seed are sown much earlier.

Looking for worms and rot

Some still use manure-heated hot beds, but most folks now use flue-heated hotbeds, which enable them to more nearly control the temperature. These hotbeds are very simply constructed and wood is used for providing heat for the flues which warm the soil above. A cloth covering is used more generally than glass, because it is less expensive.

During very cold weather when the cloth covering is used, two or more thicknesses may be put on and then a covering of pine straw or other straw or grass is put on.

The plants are usually transplanted to a cold frame after four or five leaves have developed. These cold frames are covered with cloth and usually are constructed with short rafters to give considerable room for the growth and development of the plant.

If the weather turns quite cold while the plants are in the cold frame, lighted lanterns are often hung on the rafters to provide heat. It is remarkable how much heat may be secured from a few lanterns placed in these tightly covered cold frames.

Some of the growers transplant the plants twice to get a stronger, more vigorous plant, but the general rule is to transplant them only once. When they are taken from the cold frames, they are set directly in the field.

Practically all of the green-wrapped tomatoes are sent to market in the 4 bushel crate or flat in which the tomatoes are packed in baskets holding about 3 quarts. These individually wrapped tomatoes are so packed in the basket as to present a very neat and attractive appearance.

The fruit is carefully graded. Responsible people, who know what it takes to make a number one tomato, do the grading.

THE plants are set in the field in that portion of the tomato belt outside of Florida from March 20 to early April, depending on the weather.

The tomatoes are usually staked and pruned, so as to secure the finest specimens. The staking and pruning method does not give the greatest yield in total number of pounds, but will give the greatest amount of early and large fruit.

There is no advantage in allowing more than the 4 or 5 clusters of fruit to form, because this is as many large, first quality fruit as the plant can produce in time to get to the early market. The suckers are kept pruned out from the time they start to develop to throw all the plant food and moisture into the production of the tomatoes.

Many growers prefer to have to-

(*Turn to page* 56)

Careful staking and pruning insure larger fruit

NORTH CAROLINA *Holds* Fertilizer School

AT the State College of Agriculture, Raleigh, North Carolina, on December 9, soil specialists met with farmers, fertilizer dealers, and salesmen in a one-day intensive short course on the use of fertilizers in connection with soil fertility. More than 300 of these interested agriculturists listened intently to the addresses and entered into the short discussions of the fertilizer problems of the south.

Professor C. B. Williams, Head of the Department of Agronomy at the College, opened the school. Dr. E. C. Brooks, President of the State College welcomed the visitors and expressed his pleasure at so fine a cooperation of education and business. He especially complimented the fertilizer men upon coming to the College to seek the latest facts as founded upon experimental inquiry in the use of their product.

W. A. Graham, Commissioner of Agriculture, told briefly of the growth of the use of fertilizers and the duty of the department to the industry.

To W. F. Pate, local agronomist of the National Fertilizer Association, much credit was given for the arrangement of the program which smoothly crowded into a short period of time a great deal of information.

Professor C. B. Williams discussed in detail "Wise Use of Fertilizers on Cotton—Their Effects upon Yield and Maturity for Different Soils in North Carolina." He emphasized the importance of improving the grade of fertilizer and urged that more consideration be given to recommendations made by the State Agricultural College, which institution has over a period of years made a very careful study of the fertilizer requirement of important crops on the several outstanding soil types.

CHARTS showing results of experimental work during the last 15 years were used by Professor Williams in his recommendations for best analysis for the several soil types in which cotton is grown. For cotton in the Coastal Plain he recommended an analysis of 8-5-3 at rate of 600-900 lbs. per acre. For cotton in the Piedmont section a 10-4-2 at rate of 600-800 lbs. per acre was recommended. Use of the above analysis and rate of applications showed a maximum return of $4.00 for each dollar invested in fertilizer for Coastal Plain and $5.56 for Piedmont section. Phosphoric acid was shown to be an important factor in controlling maturity of cotton.

DR. J. J. SKINNER of the United States Department of Agriculture spoke at length on "Fertilizer Results with Irish and Sweet Potatoes" in North Carolina. A comparison of yields with the use of potash from several sources on Irish potatoes showed little difference. The best analysis as shown by experimental data was a 6-6-5 and best rate of application 1200-1600 lbs. per acre.

On the Dunbar fine sandy loam in eastern North Carolina, best results with sweet potatoes were secured by using 1800 lbs. per acre of a 7-7-5. On the Portsmouth sandy loam best results were secured by use of 1600-1800 lbs. per acre of 8-6-6. The potash requirement of sweet potatoes was shown to be high in results of recent experimental work, from 6 per cent to 8 per cent being recommended. In a comparative study of analysis, the largest money return with sweet potatoes was obtained by use of 1200 lbs. of a 7-3-10.

In the Piedmont section of the state a 10-4-4 was recommended for both Irish and sweet potatoes. Nitrate of soda was reputed to be the most effective source of nitrogen for sweets.

Dr. Skinner appeared on the program again in the afternoon and discussed "Uses of Some New Nitrogenous Materials." He showed charts and tables of yields secured from use of certain air-derived nitrogen materials. Taking into consideration the cost of the several sources of nitrogen, very little difference was shown.

Mr. E. G. Moss, Director of Tobacco Branch Station at Oxford, North Carolina, gave the fertilizer manufacturers some real food for thought in a discussion of "Kinds and Amounts of Fertilizers for Best Results with Tobacco in the Old and New Belts of North Carolina." He showed that while muriate of potash or chlorine forms of potash would give equally as good yields and nearly as good quality of tobacco, it was preferable that the sulphate or more refined forms be used at least up to 50 per cent of the potash requirement.

He stated that if growers continued to use the chlorine sources of potash and the manufacturers continued to supply tobacco fertilizers, leaving out the sulphate forms, that buyers would soon begin to discriminate. Foreign buyers are already beginning to do so in Mr. Moss's opinion, and he felt that if the burning quality of our tobacco be allowed to become any poorer by failure to use the sulphate forms of potash as suggested, tobacco manufacturers would be compelled to add foreign blends, which he indicates is already being done, and at a loss of demand for the bright leaf of North Carolina.

Later in the day Mr. Moss discussed "Importance, and How to Most Economically Supply Magnesia to Tobacco Soils for Control of Sand Drown." He said the dolomitic limestone applied broadcast 60-90 days before planting at rate of 1000 lbs. per acre every three years or approximately 400 lbs. per acre each year where tobacco is grown continually was effective. He suggested further that if sulphate of potash be used in the production of quality leaf, that the magnesia might well be secured in the form of sulphate of potash magnesia.

Professor L. G. Willis of the North Carolina Experimental Station gave an interesting discussion of "Some Peculiarities of North Carolina Types with Respect to Response of Certain Crops to Fertilizer." He also discussed the relation of mechanical make-up of soils of the state to the particular kind of nitrogen for best results on cotton.

Professor W. B. Cobb of the North Carolina Experiment Station, discussed soil types from the standpoint of their strength and weaknesses in plant food.

The meeting as a whole contained much valuable information for all who attended. More meetings of similar nature would undoubtedly prove immensely valuable to students of soil fertility and to fertilizer manufacturers.

Keep the ORCHARD FIRES Burning

By V. V. Hostetler
Covina, Los Angeles County, California

"DOES citrus orchard heating pay?" has been definitely answered in Southern California by the returns from the 1924-1925 crop which had a delivered value of $122,245,523. This is the greatest return for any citrus crop, in spite of the fact that the number of cars shipped was 49,437 compared with 60,732 the year previous. The reduction in shipment was due to the freeze of the last week of December, 1924, which affected a greater area than any previous "cold snap."

Although the Eastern market conditions were without doubt unusually favorable and well handled for the growers' benefit, the financial success of the year's crop was due chiefly to the orchard heater.

The Covina district, which is one of the foremost orange shipping points in California, has the following examples of the effectiveness of orchard heating. From a ten-acre grove unheated, 100 boxes of low grade fruit were picked which brought $393, and $75 was spent to pull the remainder of the crop which went on the ground. From ten acres partially heated the fruit was all brought to the

packinghouse, 20 per cent being thrown out by the water separator, while 1271 packed boxes of low grade fruit brought a return of $3924. The crop from ten acres properly heated was 4400 packed boxes which netted $16,829.

ONE association manager estimates $1000 as an average return per acre from protected Valencia groves and from 40 to 50 per cent as the loss where groves are unheated.

With figures such as these upon their books eight of the ten shipping organizations of Covina installed or supplemented during 1925 adequate storage for fuel oil for their growers. The storage equipment consisted of reinforced concrete underground tanks of from 12,000 to 35,000 gallon capacity and sheet iron overhead tanks holding from 50,000 to 200,000 gallons.

The heaters are of many types and exemplify many theories. The original belief that a dense smoke blanket would prevent the radiation of heat from the earth and thus protect the fruit has been replaced by the knowledge that it is necessary to warm the lower strata of air in times of low temperatures. The heavy, low grade oil formerly used has given away to an oil of higher gravity from 31 to 37 degrees, which produces less smoke and more heat. The heaters have also been improved to eliminate the smoke as much as possible.

The average orange grove comprises 80 trees to the acre but in only extreme cases is it thought necessary to provide a heater for every tree. The price of oil heaters during 1925 ranged from $1.75 to $3.75 according to the type and construction. Practically all have a capacity of nine gallons and will burn from 10 to 14 hours according to draught regulation.

It is almost impossible to calculate the cost of a night's orchard heating because the heaters in the most exposed parts of the grove are usually lighted when the temperature becomes dangerous and the heating is increased or diminished according to the temperature. Seldom are all the heaters in a grove burned all night. For this reason it is also difficult to give figures for labor, but two men are usually employed on a ten acre grove equipped with oil heaters and they are paid approximately $5 each if they work the greater part of the night.

It is to be understood that such expenditures are usually necessary in only a few districts for a few nights in a season.

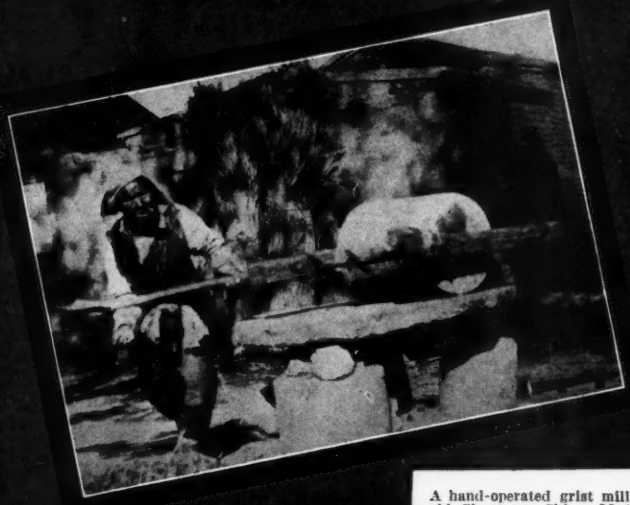
For several years the Government has maintained many stations for temperature observation in the citrus districts for the growers' benefit. During cold weather at 7:30 each night the probable minimum temperature is forecast.

Supplementing the work of the Government, the Covina, Glendora, Azusa district in 1925 organized a Central Protective Association which has four patrolmen covering the district and making temperature reports at intervals of every fifteen minutes during the dangerous periods. This information is distributed to the growers from a private telephone exchange so that there will be no delays.

Citrus growers of California have come to regard equipping for orchard heating as they do their fire insurance on their buildings: something that may not be of use for many years but which makes big returns in peace of mind at all times.

Better Crops' ART GALLERY of the month

A Perfect Pair—Alice Burkhart, Iowa, and George Cuskaden, Indiana, win titles as healthiest farm youngsters in America. More than 600,000 competed in the contest.



A hand-operated grist mill in old Shantung, China. Modern machinery is almost unknown here.

Frank Evans. Sec'y.; C. E. Bradfute, Pres.; A. R. Simpson, Treas.; and Edward A. O'Neal, Vice Pres. in Chicago Session of Farm Bureau Federation to oppose western freight rate boost.

Ralph Test, Hoosier county agent, saved many lives by bull dogging wild Texas longhorn cow loose at Chicago Stock Yards.

C. E. Troyer and L. M. Vogler, Indiana, show their reserve and grand champion corn at International Hay and Grain Show to Director G. I. Christie.

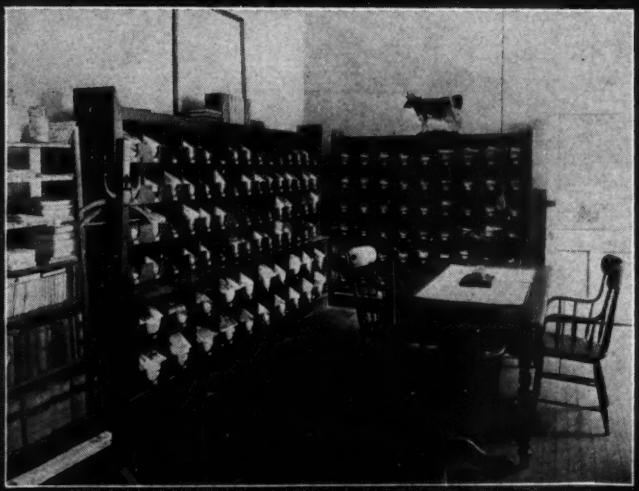
"Corn plants must be well fed and well bred." A portion of the Indiana exhibit at the International Hay and Grain Show, 1925, Chicago. The exhibit pointed out simple methods of determining fertilizer requirements for corn and methods of breeding corn.

Some of the Better Crops grown on Long Island. New Yorkers pay premiums for vegetables like these.

Monument in Harz Mountains, Germany, where in 1748 first attempts at raising potatoes in Europe were made.

No wonder Britains have good bacon. These pigs enjoy cod liver oil spooned out to them by fair caretaker.

Control of tomato pests by inoculating plants with diseased microbes is one of the new scientific researches of England.



County Agent E. I. Oswald, Md., built this neat case to file his papers, farm journals, and bulletins.

Willard Evans, thirteen-year-old club boy of Pocomoke, Maryland, makes pets of his purebred Poland China pigs. Pig clubs are among the most popular with farm youngsters, involving nearly 100,000 head of swine each year.

A Word on our Policy

EVERY useful magazine has a sound policy. The editors have given our policy earnest consideration. We feel that you would like to know what it is, and we want to tell you about it.

THE policy of BETTER CROPS is definite. It is to stimulate an interest in all factors pertaining to a more efficient agriculture and to give accurate information on such subjects.

IN developing a more efficient agriculture, you believe—as we do—that one of the most important factors is sound research and experimental work. It is our policy, therefore, to actively support all groups and agencies doing such work, especially the State Agricultural Experiment Stations and Colleges, and the United States Department of Agriculture.

WE believe that such research work is of the greatest value when translated into more efficient production and better living on the farm. Agriculture should be put on a business basis. The farmer is entitled to a larger share of the consumer's dollar. Living and working conditions on the farm should be improved. Consequently we are glad to heartily support the work of the agricultural extension forces and the county agricultural agents.

ESPECIALLY do you want all the facts, not selected facts. It is therefore a very vital part of the policy of BETTER CROPS to publish all the facts.

YOU want these facts presented by authorities in an easy-to-read and attractive form. To combine a soundness of purpose with brightness of treatment is one of our chief aims.

IT is the firm resolve of the editors to live up to this policy at all times.

THIS magazine is your forum. Will you suggest any improvements in this policy that would help you? Our office is at 10 Bridge Street, New York, south of the Customs House, near Bowling Green. We shall be glad to see you or glad to hear from you at any time.

Terry WINS Cotton CONTEST

ANNOUNCEMENT has just been made from the Mississippi A. & M. College that Will Terry, of Jackson, Miss., produced 13,520 pounds of seed cotton on three acres of land this season. In so doing he wins the capital prize of $500 in cash in the "Better Cotton Production Contest" conducted in 1925 under the auspices of the Extension Department of the College.

Other winners were Earl Love, of Doddsville, Mississippi, $300 cash with a yield of 12,603¾ pounds of seed cotton on three acres of land, and Dr. S. W. Johnston, of Vicksburg, Mississippi, $200 cash with a yield of 12,523 pounds of seed cotton on the same amount of ground.

In making 13,520 pounds of seed cotton on three acres of ground, Mr. Terry has established a record and has brought distinction not only on himself, but to the State of Mississippi, because, as far as is known at the College, his yield exceeds the yield of cotton ever made by anyone on this amount of ground.

The report of Mr. Terry on his yields was supported by affidavit from T. E. Hand, County Agent, Jackson, Mississippi; Carter Stirling, First National Bank, Jackson; F. M. Coleman, County Superintendent of Education of Hinds County; and R. H. Pate, Mississippi Bureau of Development, Jackson.

The donors of the $1,000 cash, which made the contest possible, were the fertilizer manufacturers doing business in the State and the Mississippi Cotton Seed Crushers Association, $500 coming from each of these sources.

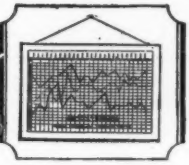
In conducting the contest, R. S. Wilson, Director of the Extension Department, and his associates, and the donors of the cash premiums realized that what is needed in Mississippi is a stimulus to the economic production of cotton, the major cash crop. They recognized the fact that it is not more acres of cotton, but more cotton per acre, which result, in the end, means more money to the individual grower and to the State.

Acre yields, or the amount of cotton produced on every acre, determines whether or not the grower makes anything out of his crop, and, generally speaking, the bigger the yield the bigger the profit. The results obtained in the contest have more than justified the efforts, for the yields produced by the winners and others standing high in the contest show that good profits can be made from growing cotton in this State.

Over 3,000 entrants in the contest competed for the premiums, a large per cent of whom rendered reports. Nine of them, in addition to the winners already mentioned, made over two bales per acre.

The exceedingly high records produced by these contestants this season, which records come from every soil type of the State, show the possibilities of profitable cotton production in Mississippi, when recognized good principles of farming are followed and should serve as a stimulus to every cotton grower in the State.

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

South Carolina Farmers Using More Concentrated Fertilizer

South Carolina has been analyzing the fertilizer sold within the State for the past 34 years and, according to the extension agronomist, plant food is now being used in more concentrated form than ever before. In the first three years of the 90's the average composition was 13.37 per cent of available plant food.

Just before the outbreak of the war the average composition had reached 16 per cent, but the shortage of potash resulting from the interruption to world trade brought the percentage down again. By 1920, however, farmers were again using a higher grade product and last year the average of all samples analyzed was 16.19 per cent of available plant food.

In commenting on the desirability of using high test fertilizer the extension agronomist gives several reasons for recommending the practice: Lower hauling and distributing costs, lower freight cost, cheaper handling, and, finally, the lower cost of plant food.

A Spraying Danger

In spraying experiments carried on by Charles E. Smith of the Bureau of Entomology and A. P. Kerr of the Louisiana Experiment Station some new facts regarding the use of certain insect poisons were brought out. It was found that sodium silicofluoride and certain arsenical poisons were much more injurious to certain plants in mixtures than when used by themselves, the conclusion being that chemical reactions occur in the presence of moisture and release high percentages of water-soluble arsenic.

The results obtained by these scientists show that in spraying work great caution should be used in mixing this sodium compound with certain arsenicals for use against insects on plants.

When used on soybeans undiluted sodium silicofluoride caused only slight burning, but a mixture made of equal parts of calcium arsenate and this chemical killed the soy beans. A mixture containing equal parts of lead arsenate and the sodium compound caused some burn but less than that caused by undiluted lead arsenate.

Heat the Hen House

One of the poultry specialists at the Ohio State University says the cheapest way to keep the poultry house warm enough for maximum egg production is to set up a brooder stove in the house and use it on real cold days. He recommends that just enough fire be kept up to take the chill off the house and keep the drinking water from freezing. Wire netting around the stove will keep the hens from getting singed. Open fronts must be closed with windows or heavy cloth and arrangement made for ventilation.

Is Yeast Good for Hogs?

Professor C. P. Thompson of Oklahoma College has carried on an experiment which seems to refute the claim that yeast aids the

hog's digestive process and results in larger and cheaper gains. In order to remove all doubt he is continuing his experiments for another year.

Pennsylvania Bans Low-Grade Fertilizer

On January 1st an amendment to the Pennsylvania fertilizer law prohibiting the sale of extremely low-grade fertilizer, went into effect. This law prohibits sale in the State of fertilizer of two or more ingredients containing less than 14 per cent of total plant food. The law also specifies that no commercial fertilizer shall be sold containing less than 1 per cent of ammonia, 1 per cent of available phosphoric acid, and 1 per cent of water-soluble potash. It is thought that the number of brands of mixed fertilizer will be greatly reduced and farmers will be relieved of much confusion in making purchases.

Many Poultry Flocks Now Accredited

At the annual meeting of State marketing officials, held at Chicago early in December, it was brought out that about half the States now have some form of accreditation for poultry flocks or hatcheries. When this work started about five years ago there was a great deal of confusion, but since then a committee has been working toward uniformity in control regulations.

Dr. L. E. Card of Illinois said that a plan for accrediting or certifying poultry should aim at economical production, be sound in theory, practical, and not cost too much. Three distinct steps applying to flocks, eggs and chicks are recognized: accreditation, certification, and record of performance.

A. L. Clark of the New Jersey Bureau of Markets suggested the need for Federal participation in the development of standards. He believes that this work will form a basis for judging poultry which will bring the utility breeders and fanciers together and lay the foundation for pedigreeing poultry.

Fertilizers Not Guilty

Tests carried on for the past two years at Sanford, Florida, have shown that celery, a major crop of the region, develops the black-heart disease largely as a result of fluctuations in the water supply. When the work was started it was suspected that the plants showing this condition owed their black-heartedness to fertilizers. By maintaining an adequate but not excessive supply of moisture throughout the growing season, being particularly careful not to overwater toward the end of the season, the disease practically may be avoided.

Nevertheless, new facts were brought out regarding the fertilization of celery in this region where it is applied as heavily as four tons or even more to the acre. The composition must be looked to carefully for, although the water supply is the principal factor in black-heart, too heavy applications of plant food or the wrong kind will damage the crop. On land that has had no crop for several years four or five tons to the acre may be used, but on fields cropped regularly year after year smaller applications are better. The United States Department of Agriculture, which has been cooperating in these experiments, says that a fertilizer lower in phosphate and higher in potash than that generally used in the locality is giving best results in the growing of celery.

Foreign and International Agriculture

The purpose of this department is to help us understand the scientific, practical, and industrial agriculture of other countries and the international developments which result. The editor believes that such knowledge is now of the greatest importance in our agricultural prosperity. Every care is taken to insure accuracy—both of facts and their interpretation.

WE all know that the agricultural experiment stations of Germany have done good work. Bernburg, Darmstadt, Giessen, and Bonn are familiar names.

But in addition to these official experiment stations, private initiative has been relied upon to carry on soils experiments and develop new strains of plants. Large German landowners are continually making soil experiments under field conditions to find the value of fertilizer applications on various types of soil in actual practice.

This has been especially true since the war because many of the younger generation, second and third sons of landowners who formerly went into military occupations, are now coming back to the land either as farm managers (verwalter) for their older brothers or as experts along special lines.

The largest farm in Germany, the Wentzel estate near Halle, employs a full time man whose sole work is the superintending of soils experiments. This estate also carries on a plant breeding establishment that rivals some experiment fields in size and thoroughness.

Quite a few of the large farms hire full time soils men, but generally speaking, several large farmers cooperate by hiring an expert to do the work, thereby dividing the expenses.

Rather large plots are laid out in the fields so as to give the fertilized areas exactly the same treatment as that given the untreated areas. By so doing all the increase in yields can be attributed to the treatment and they can tell whether increases are great enough to pay for the costs.

Small farmers benefit from these experiments by watching them. If results are especially noticeable, they will copy the practices the large farmers indicate are profitable.

These large landowners make their experiments directly in the fields because they seem to have little faith in the small plot and pot experiments, except as indicators of what might be advisable to try. They say that there are too many factors such as labor, soil conditions, and climate entering in to allow them to rely wholly on the small plot method of testing.

The experiment station at Weihenstephan operated by the Province of Bavaria is an especially interesting one. It was our privilege to visit this station with a young instructor by the name of E. Nitter, a dashing sort of fellow who was assisting Director Kulisch in the classroom. The fertilizer experiments being carried on there were quite similar to those in many American experiment stations, but the seed and grain improvement work are worthy of mention.

Assessor Crebert, in charge of the seed experiment work, showed us a great many crosses with many kinds of grasses that were being made in an attempt to find a suit-

able grass mixture for the various types of soil in Bavaria. He had hundreds of plots of grass, and it was truly surprising to see how much difference there could be in varieties of grass.

The station was not only trying to develop new strains but it was also getting new varieties from all parts of the world in an attempt to acclimate them to the rigors of the Bavarian climate.

E. Nitter in Bavarian costume

As we came to the wheat experiments, Nitter told us how the Hessians had taken the Hessian fly with them during the Revolutionary war. The descendants of those flies have since done many times more damage in America than the entire cost of the War of Independence.

The Weihenstephan station has recently developed a variety of wheat that appears to be immune to the ravages of this fly. Nitter said that the yields from this new strain were not so great as those from other improved varieties but hopes are held out for improvement in yields so as to make the wheat more desirable.

A smut-resistant variety of wheat has also been found there in very recent times. The discovery of this smut-free grain was very similar to that of the finding of the cabbage that is immune to cabbage yellows, a discovery made at the University of Wisconsin some years ago. This wheat will be a great thing for the world if it can be propagated with good results in other climates.

Germany, being the greatest potato-growing country in the world, is very much interested in ways and means of improving both the eating and stock feeding varieties. Nitter said that some very good results have been received from this work but the experiments had not been running long enough to enable them to make any definite reports of progress.

One type of experimental work which seems to be very valuable is that of testing farmers' seeds for yield, quality, and disease resistance. Farmers who want to sell seeds desire to have the approval of the station so they send in samples to be tested on the college acres.

The seeds are planted, yields are compared, and a prize is given each year to the men who have the best varieties. It really amounts to a kind of contest somewhat similar to Iowa corn yield contests. These results are then used by the growers for publicity material when they sell their seed.

After a new strain is developed at the station, provision for its dissemination into the country are quite different from those in America. Here we usually send small samples to various parts of the state and depend on each individual farmer to propagate the

(*Turn to page* 63)

REVIEWS

Report of the Secretary of Agriculture, 1925

It is very gratifying to note from the report of the Secretary of Agriculture, W. M. Jardine, that agricultural production this year on the whole has been well balanced. The value of the 1924-25 for all farm production represents an increase of 7 per cent over 1923-24. Farmers are receiving better prices for their products than at any time in the past five years.

While the picture for the entire country shows increasing prosperity, it must be noted that drouth affected some sections, particularly the southwest and an area from the Ohio and Potomac rivers southeast to central Georgia and east to the Atlantic.

The Secretary points out that the increase in foreign cotton production should be carefully studied, and reports that the Department of Agriculture is giving very close attention to possible competition from such sources.

The major crops are discussed in detail. Agricultural exports for the year ending June 30, 1925, were 21 per cent greater in volume than in the previous year.

Foreign competition continues to grow stronger in some lines of farm production. The report does not advocate the supervision and control of cooperative movements. Such associations are business concerns and should stand on their own feet.

Freight rates are carefully considered from the viewpoint that there should be substantial readjustments in such rates. The very important question of the surplus of some products is also discussed and what can be done towards handling such surplus, is one of the major economic problems of the nation. The opinions of Secretary Jardine on this subject are given.

Rubber possibilities in the United States, the plant quarantine act, grazing leases, federal-aid roads, are also given due consideration.

Everybody interested in the development of our basic industry, Agriculture, should carefully study this report.

The Potato News Bulletin, November, 1925

What causes poor stands of potatoes? In this bulletin H. R. Talmage, prominent potato grower of Riverhead, N. J., gives his opinion from actual observation that "the most common cause of poor stands is due to the fertilizer coming in contact with the seed." This is a very interesting observation and is in part confirmed by the research work discussed in the review of the next bulletin in this column.

The second common cause for poor stands is seed infected with late blight. On Long Island rhizoctonia is another cause.

Other very interesting articles in the bulletin are on "Hill-Unit Selection of Potatoes," "A Special Train Load of Certified Seed Potatoes," and especially an article on "Future Possibilities with the Potato" and "Cooperation in Certified Seed Production." The Bureau of Agricultural Economics, United States Department of Agriculture discusses the present high potato prices.

Fertilizer Experiments: Research Bulletin 65, October, 1925, Agricultural Experiment Station, University of Wisconsin, Madison

No practical question regarding the use of fertilizers requires such definite answer as how to apply fertilizers without delaying or preventing germination, or causing a streaky condition in fields where fertilizer is applied.

We are therefore very glad to learn that this and associated problems have been carefully studied at the Agricultural Experiment Station of the University of Wisconsin by a group of workers, Emil Truog, H. J. Harper, O. C. Magistad, F. W. Parker and James Sykora.

The investigation was undertaken for the purpose of studying the various effects which fertilizers have on crops.

It was found that the method of applying the fertilizer was so important that a large part of the study was devoted to that subject. This work was to study particularly the action of fertilizers in the hill and drill row.

The experimental work was done in the laboratory greenhouse and field for a period of five years. Several crops were used, but because of the importance of the crop and its adaptability to special fertilization, corn occupied a prominent place.

The results of this very practical investigation are given in 55 pages of closely printed material containing 23 tables and 12 figures.

It is very interesting to observe that potato sprouts were found to be much more sensitive to fertilizers than corn sprouts. Considering germination and early growth, the best method of fertilizing corn is to spread it about ½ to ¾ inch above the seed.

Fertilizers may serve two purposes, as plant food and to decrease the danger of freezing. It is also very important to note that while there is very excellent machinery for applying fertilizers, some attachments on corn planters do not apply fertilizers as well as they might.

A great deal of practical information is given on the methods of application of fertilizer and effect on germination, especially on corn, oats, cabbage and potatoes. Results are also given on ammoniacal and nitrate nitrogen and the secondary effects of fertilizers.

(These experiments were conducted under a fellowship grant from the Soil Improvement Committee of the National Fertilizer Association. The authors are indebted to A. R. Albert for assistance in starting the experiments.)

A Hand Book of Agronomy: Bulletin No. 97, June, 1925. Virginia A. & M. College & Polytechnic Institute and the U. S. Department of Agriculture Cooperating. Extension Division, Blacksburg, Va.

So much information is being published in these days on different agricultural problems, that it is always useful to find a hand book that gives the many facts on crop production for any definite crop region. One of the latest to be published is the "Hand Book of Agronomy" compiled by G. W. Patteson, Jr., T. C. Maurer and S. R. Bailey.

This book is divided into two sections. The first section gives a great deal of information on some 60 crops, a very important part of which is a group of 18 grasses. Part II discusses crop rotations recommended for Virginia, inoculation of legumes, lime and fertilizer recommendations, the composition of fertilizer materials and very valuable information on the control of diseases and the eradication of weeds. It is a very useful hand book.

(Turn to page 45)

The Influence of Potash on Cotton

(*From page* 10)

THE potash content of the Wickham sandy loam, on which the experiment was made, is low in comparison with most of the Piedmont soils from which it was derived, but it is as high as in other Coastal Plain soils surrounding it.

The data giving the yield of the various fertilizers on Wickham sandy loam are given in Table 1. The yield secured at the first picking, the total yield, and the percentage of the total yield of cotton opened at the first picking are given for each year and it will be seen that there is a marked difference.

The fertilizers are arranged into groups. In Group A the fertilizers containing only phosphate, only nitrogen, and only potash are given. Group B contains fertilizers composed of phosphate and nitrogen; Group C, mixtures of phosphate and potash; and Group D, mixtures of nitrogen and potash. Group E contains three fertilizers, one high in phosphate and low in nitrogen and potash, the second high in nitrogen and low in phosphate and potash, and a third high in potash and low in nitrogen and phosphate. Group F contains the three fertilizers each having two of the constituents in equal proportions and a third constituent lower.

The yields given by the three fertilizers in Group A show the need of the soil for potash fertilizers. In both years the yield was greatest from the use of potash and was least from the use of phosphate.

A comparison of yields from the fertilizers in Groups B, C, and D

Fig. 2.—Cotton in fertilizer experiment on Wickham fine sandy loam. October 25, 1923

Left, fertilized with a mixture containing 9% P_2O_5, 3% NH_3, and 3% K_2O, at rate of 900 pounds per acre.

Right, fertilized with a mixture containing 9% P_2O_5, 6% NH_3, and no potash. Note the heavily fruited stalk and fluffy top cotton on the left in contrast to the defoliated plant and small partly opened boll on the right.

Fig. 3.—Cotton in fertilizer experiment on Wickham fine sandy loam, Fayetteville, N. C., September 21, 1923. Fertilizer containing 6% P_2O_5, 9% NH_3, and no K_2O was used at a rate of 900 pounds per acre. Note the defoliated plants and small, poorly opened bolls

shows the relative effect of the mixtures. In 1923 the average yield for the phosphate-nitrogen mixture (Group B) was 756 pounds of seed cotton per acre, against 477 pounds as an average for the phosphate-potash mixtures (Group C) and 981 pounds as an average for the nitrogen-potash mixtures. In 1924 the average yields for each group were respectively 607 pounds, 544 pounds, and 873 pounds. The largest yield was produced by the nitrogen-potash fertilizer.

A comparison of the three fertilizers in Group E also shows the beneficial effect of both nitrogen

Fig. 4.—Cotton in fertilizer experiment on Wickham fine sandy loam, Fayetteville, N. C., September 21, 1923. Fertilizer containing 6% P_2O_5, 3% NH_3, and 6% K_2O was used at a rate of 900 pounds per acre. Note the cotton still retaining its foliage

and potash in contrast to the minor effects of phosphate on yield of cotton on this soil.

In Group F, which comprises mixtures approaching equal proportions of the fertilizer elements, there is not a wide variation in the yield of cotton from the three mixtures.

The data as a whole show a high nitrogen and potash requirement for cotton production on this soil, while phosphate has but little influence on yield.

It is interesting also to examine the data from the point of view of the effect of phosphate, nitrogen, and potash on time of maturing of the cotton.

Where phosphate was used singly, a very small yield was secured, but in 1923, 61.6 per cent of the cotton opened early against 47.2 per cent of that fertilized with nitrogen and 74.4 per cent of that fertilized with potash. In the following year the result was somewhat similar.

In Group E the complete fertilizer high in phosphate gave a small yield but matured 75.7 per cent of its cotton early. The high nitrogen mixture matured 54.9 per cent of its cotton early and the high potash mixture 79.2 per cent in 1923, which result is in harmony with that secured in 1924.

In the phosphate-nitrogen mixtures (Group B) a larger percentage of the cotton opened earlier than the cotton in the phosphate-potash mixtures (Group C) or the nitrogen-potash mixtures (Group D).

FROM the data as a whole it becomes apparent that while phosphate has had very little influence on yield it has had an effect in the maturing of cotton and in this way

(*Turn to page* 46)

REVIEWS

(*From page* 42)

Experiments in Rice Production in Southwestern Louisiana: U. S. Department of Agriculture, Bulletin No. 1356, October, 1925

Many farmers in the United States would hardly know rice with any degree of certainty, yet it is an important crop in Louisiana. The superintendent of the Rice Experiment Station at Crowley, Louisiana, J. Mitchell Jenkins, in cooperation with Charles E. Chambliss of the Bureau of Plant Industry, has recently published a very instructive bulletin on the results of cultural experiments conducted for 13 years, which subjects include seed bed preparation, seeding, soil fertilizing, irrigation, rotation and weed control.

Some of the more noticeable results are that the best depth of planting is 5-7 inches; a smooth seed bed was the best; the largest yields were produced when rice was planted about May 14th. The largest yields were obtained by growing the crop in rotation with the Biloxi soy bean, though when fertilizers were used, the results were as follows: "Acid Phosphate, sulphate of ammonia, nitrate of soda and cottonseed meal did not increase the yield of rice when applied alone, nor did acid fertilizers when applied with other fertilizers.

"Dried blood may be applied as a source of nitrogen for rice when a legume is not used to supply this plant food.

"Sulphate of potash applied at the rate of 100 pounds per acre produced an increase in yield when used alone and with sulphate of ammonia."

The bulletin contains a great deal of practical information obtained as a result of this 13 years

(*Turn to page* 47)

The Influence of Potash on Cotton

(*From page 45*)

is a factor in the fertilization of cotton in this soil, but its influence is a minor one as compared to nitrogen which produced a vigorous plant capable of producing an abundance of fruit, or of potash which is a prime factor in the metabolism of the plant in rust prevention and boll formation and maturation. The effect of potash on cotton on this soil is unusually striking and its influence is much more pronounced than on most soils of the cotton belt.

TABLE 1.—*Yield of cotton on Wickham fine sandy loam.*

(Pounds of seed cotton per acre.)

Group	Fertilizer formula P_2O_5-NH_3-K_2O	1923 Yield, first picking, Sept. 21	1923 Total yield	1923 Percentage of total yield matured by Sept. 21	1924 Yield, first picking, Oct. 3	1924 Total yield	1924 Percentage of total yield matured by Oct. 3
A	15-0-0	198	324	61.6	198	342	57.9
Single	0-15-0	306	648	47.2	216	504	42.8
	0-0-15	576	774	74.4	432	756	57.1
	12-3-0	540	666	81.1	360	468	76.9
B	9-6-0	432	612	70.6	342	522	65.4
No potash	6-9-0	612	882	69.4	432	612	70.6
	3-12-0	504	864	58.3	468	828	56.6
	Average	522	756	69.8	400	607	65.9
	12-0-3	306	468	65.4	270	486	55.6
C	9-0-6	288	450	64.0	306	558	54.8
No nitrogen	6-0-9	180	414	43.5	180	468	38.5
	3-0-12	414	576	71.9	414	666	62.2
	Average	297	477	61.2	292	544	53.7
	0-12-3	432	792	54.5	252	666	37.8
D	0-9-6	736	1116	65.9	594	972	61.1
No phosphate	0-6-9	702	1026	68.4	612	990	61.8
	0-3-12	774	990	78.2	576	864	66.7
	Average	661	981	66.7	508	873	58.1
E	9-3-3	504	666	75.7	450	738	61.0
Unbalanced	3-9-3	504	918	54.9	396	810	48.9
complete	3-3-9	756	954	79.2	576	846	68.1
F	6-6-3	846	1080	78.3	522	1044	50.0
Balanced	6-3-6	774	972	79.6	666	1080	61.7
complete	3-6-6	738	1044	70.7	576	900	64.0
No fertilizer		180	342	52.6	72	270	26.7

REVIEWS

(*From page* 45)

of this good experimental work.

Insecticide and Fungicide Laws: U. S. Department of Agriculture Insecticide and Fungicide Board, S. R. A. Insecticide No. 52, November 1925

The various states have made a number of laws with regard to the manufacture and sale of insecticides and fungicides. This bulletin is very useful, as together with previous announcements Nos. 13, 21 and 35, it gives a complete summary of the present laws and amendments made to old laws to January 1st, 1925.

Abbreviations Employed in Experiment Station Records for Titles of Periodicals: U. S. Department of Agriculture, Dept. Bulletin No. 1330

The Experiment Station Record is well known to all workers in agriculture. It will be surprising to many such workers to know that this very useful publication abstracts articles from well over 3500 publications. The list of publications itself is therefore very instructive and the abbreviations of course are essential. It should be in the hands of all workers who use the experiment Station Record.

Johnson County Soils: University of Illinois, Agricultural Experiment Station Soil Report No. 30. June, 1925

This report is one of the series of soil surveys made by the State of Illinois. It shows that the most important soil type in Johnson county is the yellow silt loam. This is bordered by swamp and bottom land soil. In this survey a supplement contains field data from experiments conducted on the soil types similar to those occurring in Johnson county, which adds very much to the value of the survey for practical uses.

Dance Helps the Farmer

(*From page* 11)

butted, and prepared for delivery to the men who buy it.

"Although this is only our third year," says Dance, "we already have many farmers growing seed corn for us. In order to get them to grow the best seed, we traded in the old seed corn they had, supplying them with pedigreed, Wisconsin Nos. 7, 8, and 12 varieties and sold their old corn to farmers who wanted seed for silage purposes."

How many kernels? One of Dance's publicity stunts

"The seed business," this ex-county agent declares, "is a seasonal business. It keeps us busy in the spring, and early summer, and again at storing time in the fall, so in order to have something to do all the year round we buy and sell feeds to the farmers, and handle all kinds of spray materials, poultry equipment, and garden supplies. We buy feed in car lots and sell it to the farmers as they need it."

The farmers around Waupaca find this seed store a convenient place to meet each other because the company does all it can to give the atmosphere of the place a welcoming tone, and is always ready to answer the farmers' questions and help them to solve their individual problems.

MR. DANCE is kept busy much of the time just answering questions. Since he has had a great deal of experience in this line while he was county agent, he does not find it unpleasant.

"We realize that we are benefiting ourselves when we answer the farmers' questions. They come here to ask how to remodel poultry houses, how to mix poultry feeds, and how to cull chickens. It is to our interest to furnish them with this information, for we know that the better the conditions they have for raising poultry the more feeds they will buy from us. The feeling of good will that this type of service engenders is worth much in dollars and cents, but it is also worth a great deal to have pleasant relations with one's customers as well."

Last year the company sold over $1,000 worth of inoculative cultures at cost, to increase alfalfa and legume yields in the community. The inoculin was supplied by the Wisconsin College of Agriculture on condition that it should be delivered on this basis. Inoculin provision is a service that is usually performed by the county agent, but there are few county agents in the state that have supplied as much as this to the farmers of their counties.

Dance says that they are glad to do this because they realize the value of alfalfa to the community, and indirectly to their own prosperity, so they welcome any opportunity to increase the acreage of this crop. Their efforts are meeting with success, for Waupaca county considerably increased its alfalfa seeding last year, many farmers substituting alfalfa for potatoes, which are not always profitable when conducted on a one-crop basis.

"SINCE we are located in the heart of the central potato belt, farmers ask us a great many questions about seed treatment and about fertilizers. They ask us how to control potato bugs, potato blight, and leaf hoppers.

"When we answer these questions, and when we give spraying demonstrations to show them how to eradicate their pests, whether on their potato fields or in their orchards, we are helping both them and ourselves. We sell seed potatoes and furnish the farmers with a large percentage of the spray material."

Mr. Dance does not profess to be able to answer all of the questions that the farmers ask him, for farmers have their individual problems. However, he does keep a supply of the commonly used bulletins put out by the United States Department of Agriculture and by the University of Wisconsin.

These bulletins are available for free distribution, so when a farmer or vegetable grower asks Dance something that is not in his particular line, he gives the man the bulletin that applies to the particular problem at hand. He tries to keep posted on the most common questions that farmers ask him.

LAST winter when little interest was displayed on the part of merchants to stage the customary corn and grain show, Dance decided to hold a corn show of his own. It proved to be a fine suc-

cess, with over 50 entries of choice corn of all popular varieties.

Aided by the State Bank, more than $100 worth of premiums were offered. The corn was kept on exhibit for a full month as an inspiration to all who visited the store. The other business men of the town were glad to join the seed company in holding a show in the armory this year.

By understanding the farmer and his needs, and by realizing that the prosperity of the firm depends on the prosperity of the people who patronize it, this firm bids fair to be a success in the community it is attempting to serve.

Both Ends and the Middleman

(*From page* 13)

movement than the increase in the number of active associations, because associations are getting bigger all the time. They are continually being merged, consolidated, and expanded. Moreover, the disappearance of a cooperative association doesn't necessarily mean a net loss to the movement since its members often join some new larger organization.

Ten years ago cooperation was confined largely to the north central and Pacific States. Now it is spread all over the country. More than 40,000 names of cooperative associations are on file in the Department of Agriculture, but among these are many duplicates and many inactive concerns.

Every region in the last 10 years, however, has shown a large increase both in association membership and in cooperative business. Cooperative business done in cotton in 1923 totaled $100,000,000; in dairy products $400,000,000; in fruit and vegetables $300,000,000; in grain $600,000,000; in livestock $250,000,000; in nuts $50,000,000; in poultry and poultry products $50,000,000; in tobacco $150,000,000; in wool $20,000,000; and in merchandise $160,000,000.

Not many years ago farmers' business organizations were mostly local enterprises, with occasional federations of locals for selling purposes. To-day many associations operate over important producing sections and sometimes over entire States. Fifty of the new large associations have a greater aggregate membership than all the

This New York City market supplies hotel trade. Poor facilities increase trucking charges 25 per cent

5,524 associations from which reports were obtained in 1915.

HERE is a powerful force tending to introduce into distribution the principles that have made production efficient, both in industry and agriculture. These principles are summed up under the head of the economy of large-scale operations. In production, efficiency has been found in division of labor, in standardization, in mass operations, and in the elimination of costs due to unnecessary competition. All those efficiency factors are being introduced into distribution by the cooperatives.

Other distributing organizations are working along the same line. Cooperatives have no monopoly of the opportunity to bring distribution into line with production in the application of modern efficiency methods. They merely happen to be doing it on a bigger scale than anyone else just now. And according to Judge R. W. Bingham, of the national council of farmers' cooperative marketing associations, they are doing so with very few casualties.

"Within the last five years," Judge Bingham recently told the United States Chamber of Commerce, "commodity cooperatives have had the best business record of any other form of business in the United States. There have been more failures of great banks within that period, more failures in the large railroads, and a higher percentage of bankruptcy in every other form of business, than among commodity cooperative organizations. . . ."

Our problem of distribution is not one of wiping out illicit profits, or of breaking down oppressive groups that intervene between the producer and the consumer and take toll from both.

That no such effective banditry is practiced seems to be an unavoidable inference not only from the heavy mortality among middlemen, but from official investigations showing that the profits taken by distributing agencies are only a small fraction of the price finally paid by the consumer. Essentially, the problem of distribution is simply to get it organized as efficiently as production is organized.

OUR present system of distribution is an out-of-date inheritance from the days when production as well as distribution was on a local scale. In those days manufacturing costs were high, from lack of machinery and labor-saving devices, but distribution costs were low. Today, with production geographically specialized and depending on a world market, the urgent need is for improved distribution processes, and this is a mechanical, technical, and financial problem. It is also a problem in regulating the flow of commodities to market.

Cooperatives are pointing the way to the solution. But they are not going to do the whole thing by themselves. That would be too much to expect of them. It would be the same as relying on cooperative associations to take over the entire business of distribution.

Other agencies, we may be quite sure, are not going to be shouldered aside to that extent. If distribution is to be made cheaper and better, it will be by the introduction of labor-saving devices, by the lessening of destructive competition, by resort to the principle of large-scale operations, by grading and standardization, and by a more thorough exploitation of market possibilities by every agency engaged in the business.

Education—The County Agent's Life Saver

(*From page* 15)

Abandoned sandy land in Iowa produced this crop of alfalfa after experiments with fertilizers and proper rotations

succeeded they have been a great impetus to the work, but where they have failed they have in many instances almost wrecked the local organization.

Even educational work, in all of its various forms, does not always go over in the way that we fondly anticipate that it should. However when it is based upon sound, sensible, educational practice or experience, and then projected into the proper channels in the right time and in the proper way, its efforts are not wholly lost, and though it may not always succeed, nevertheless it is building in the right direction.

Results of educational work are not always evident, not even measurable. But the effect is cumulative and later these efforts bear fruit. Without question it is the greatest field of usefulness of the county agent system, and perhaps it is its greatest weakness, for all too often these efforts are not appreciated by the people. They want, in many cases, more direct results. "Touch their pocket book," as somebody has said, "and they will respond." This is literally and absolutely true. Educational work does this, but its results do not always come quickly, nor are they always measurable from the standpoint of dollars and cents.

Let me illustrate. One of the most far-reaching and most important campaigns that has been waged on a large scale throughout the United States has been the eradication of bovine tuberculosis. Every county agent knows the consequences of this awful disease in human suffering; he knows the enormity of the losses in our livestock. In truth, the disease had gained such a foothold in the great livestock producing sections of the country that it threatened the very foundation of our livestock industry.

Through the educational work of the county agent system this insidious disease is being rapidly eradicated and controlled. I say this with no reserve for it is through the county agent system

that this work is being largely accomplished. It is a monument to the efficiency of the system though perhaps it may not be fully appreciated. None can say what it has been worth in human happiness; nor is it possible to place a value upon its fundamental economic worth.

We are now face to face with a new movement in American agriculture, that of cooperative marketing. The county agent has carried on organization and educational work that has laid the foundation upon which this structure is to be built. He has not done the marketing work directly and it is well that he has not. But he has helped in the organization of cooperative enterprises that are beginning to function successfully; he has been conducting educational work that has been preparing the proper attitude of mind, which after all is the most essential. Cooperation will never succeed unless first there is present the proper mental attitude and conception of what cooperation and cooperative marketing really mean.

Boys and girl are learning what cooperation means from their club work; the men and women are getting the true conception of it in their township or local meetings. They are learning a sense of their own power in these meetings just as the New England fathers, prior to the days of the American revolution, in their own meetings, learned the power of concerted action and felt the pulsation of their own strength.

That spirit made them free. The same spirit will some day give the farmer economic independence and a control over the destiny of his own markets. I think that these local meetings and the educational effort that has been made effective through them are the really outstanding accomplishments of the county agent system.

There is another line of educational endeavor that has a very proper place in the program of every county organization. I shall include here both experimental and demonstrational work because they are more or less of the same nature as far as the individual farmer is concerned. Such projects may well include two or three of the major lines of crop or livestock production or soil fertility.

Perhaps in nearly every section

Yields were carefully checked up to determine the most profitable fertilizer treatments

of the country the problems of the soil are basic. And because the prosperity and welfare of the people depend upon the fertility of the soil, some work of this nature should be included in every well-balanced program of educational work. The economic value of such work is very appreciable and its effect upon the future types of agriculture and practices of farming will be very marked.

By way of illustration let me suggest that the rapid introduction into certain sections of the country of such crops as soybeans, alfalfa, and sweet clover, the liming of land, the use of fertilizers on certain lands and for certain crops, owe their introduction and rapid extension to experimental and demonstrational work conducted by the county agent.

Let me give an illustration of a demonstration which was also in the proper sense an experiment. It was put on in Black Hawk county, Iowa, to determine and demonstrate not merely the effects of limestone, phosphorous and commercial fertilizer, but the far more important problem—that of reclaiming about 5,000 acres of abandoned sandy land by the growing of alfalfa, sweet clover, soybeans, dalea, clover and other leguminous crops. It is impossible to measure the results of this work in cold dollars, but the results of it have been that hundreds of acres of this land are already being reclaimed; and many a poor fellow who was eking out a miserable existence and hanging on by his eyebrows, has been made happy because he can see the sunshine and the prosperity of a better day. Hundreds of people come annually of their own accord to see this reclamation project.

My attention has been called recently to another similar project conducted in Bremer county, Iowa. It was carried out on heavier soil, but it illustrates the possibilities of this type of educational work. Two or three of such demonstrations in a county will mean that the system of soil and crop management will ultimately be changed and benefited.

Such demonstrations as these are worthwhile. They justify the expenditure of the vast sums of money which the people contribute for the support of this type of extension work. They still allow much time for other work to be done, and the educational value of such work continues long after the experiment or demonstration itself has been completed.

The program of work of any county should not be narrow nor lopsided. It must be determined by the particular needs of the people and the peculiar fitness of the county agent to carry them to a successful conclusion. Not always is it the work which the people demand, which is most important. Sometimes the things that should be done require courage and a high degree of self reliance. In some places there is a demand for commercial or business ventures. The county agent, as a general rule, is not the proper person to engage in this, and such work may well be left to those institutions which are already organized to handle legitimate business.

When farmers organize to go into business of their own the county agent may be of great assistance in originating, promoting, or assisting in such work, but his efforts will count for most when they are confined to the educational side of all such projects. He will find in this field less room for criticism and less trouble; there will be plenty of opportunity for the full use of his talents and all his time; and there will be also the greatest possibility of success.

Fertilizers in Alabama

(*From page* 14)

Kind and Amount of Fertilizer Used in Alabama Season 1924-25.

Kind	*Tons*	*Kind*	*Tons*	*Kind*	*Tons*
Phosphate 16%	122,620	8½-2½-5	4,048	11-2½-3	13,787
Phosphate 18%	5,895	9-2½-5	45	11½-2½-2	86
Phosphate 20%	976	9-3-4	3,391	12-0-4	4,087
Soda	67,881	9-3½-5	20	12-0-5	340
Kainit	11,378	9-5-2	105	12-2½-2	4,963
Manure Salts	688	9½-2½-4	574	12-2½-4	69
Muriate of Potash	6,914	9½-4-7	178	12-3-3	116
Bone Meal	72	9½-4½-4½	867	12-4-4	8,560
Tankage	318	10-0-6	119	12-4-8	55
Pulv'd Manure	68	10-2½-3½	1,045	12-6-2	125
6-6-6	96	10-2½-4	20,182	12-6-4	25
6-8-4	50	10-3-3	64,475	13-2½-1	93
7-5-5	40	10-3-4	45	14-2½-2	147
7-5-7	70	10-3-5	238	14-3-2	45
8-3-5	44,569	10-3-6	20	15-3-5	294
8-3-8	59	10-4-2	800	15-5-5	1,582
8-4-4	21,732	10-4-4	18,982	16-4-4	10
8-4-5	1,765	10-4-5	935	18-6-6	13
8-4-6	360	10-4-7	815	*Miscellaneous	59
8-5-3	111	10-5-3	60	*Unknown formulas	71,219
8-5-4	88	11-0-5	150	*Unaccounted for	70,961
8-6-4	84	11-2½-2½	68	State Total	579,662

* Miscellaneous" tonnage includes those formulas with less than 10 tons each.

"Unknown formulas" represents that tonnage without available record as to formula.

"Unaccounted for" tonnage may be partly unused tags and that delivered in small lots for which shipping records not required.

A detailed analysis shows that the Alabama farmer uses more phosphoric acid than the entire amount of potash and nitrogen combined. To insure more economic production on Alabama farms both the nitrogen and potash content of the average fertilizer should be increased.

* * *

Renovating the Farm Orchard

(*From page* 7)

year's crop during and immediately following the blooming season.

If there is a shortage of the plant food at that time the tree is naturally not able to do both things at one time, with the results that no fruit buds are formed for a repeat crop.

THE average farm apple tree is invariably poorly supplied with nitrogen which is the main plant food element lacking in the average farm apple orchard soil. In the farm orchard which has been bearing for a good many years it is never a mistake to make a yearly application of five to seven pounds of nitrate of soda or sulphate of ammonia per tree.

Scatter the fertilizer mostly over the ground under the drip of the branches in a strip eight or ten feet wide. Make the application when the blossom buds show pink in the spring.

Barnyard manure is one of the very best fertilizers for bearing apple trees, but will not show such an immediate invigorating effect on the trees as will either of the forms of nitrate mentioned above. It is most stimulating when plowed or disked into the soil between the trees.

An orchard which has been in sod for a number of years will be greatly benefitted by plowing and cultivating even for one season. The plowing, however, should be very shallow so as to disturb just as small a number of the roots as possible. A wagon load of manure to each old tree will not be too heavy an application and should be supplemented with nitrate in addition.

REGULAR annual cultivation of the small farm orchard is rarely practical as this work comes during the busy season in the farm when the first call on time and horse power rightly comes from the main farm crops.

The practice of covering the ground under the trees and out to three or four feet beyond the tips of the branches with straw is an excellent substitute for cultivation. It has the added advantage of being a system of management in which all of the work can be done at any time during the winter months.

Any roughage about the farm makes good mulching material such as corn fodder, stalky manure or clover seed threshings. This type of mulch must be renewed each winter and should always be deep enough to smother out all weeds and grass.

One caution in this regard is that once a system of mulching is started in the orchard it should be continued as it draws up the root system of the tree and if the mulch is not replenished at least once a year a portion of these roots near the surface will dry out and be killed.

Commercial orchard practices cannot always be entirely followed in the home orchard. However, the method of soil management in the most profitable orchard in Indiana is both interesting and instructive.

The orchard consists of 60 acres of apples now 21 years old. Every tree is kept mulched with straw as far out as the limbs extend. The space between the trees is double-disked about 10 times per season and receives an application of 10 tons of manure to the acre every other year.

In addition to this ideal combined system of mulch, cultivation and manure, each tree receives five pounds of nitrate or sulphate each spring. It has not missed a crop in six years on most varieties.

(An article on spraying will follow in an early issue.)

* * *

TRUE TO THE FAITH

Little Isador Shapiro rushed into the grocery store. Banging a dime down on the counter he panted: "Gimme for ten cents animal crackers. Take out the pigs."—Farm Life.

Early Tomatoes in the South

(*From page 24*)

matoes follow corn or some other crop of this kind, because there is usually much organic matter to be turned under and this seems to especially benefit the tomato. Usually the ground is flat broken or bedded in late fall or early winter and allowed to remain in this shape to absorb the winter rains until just before getting ready to set the plants in early spring.

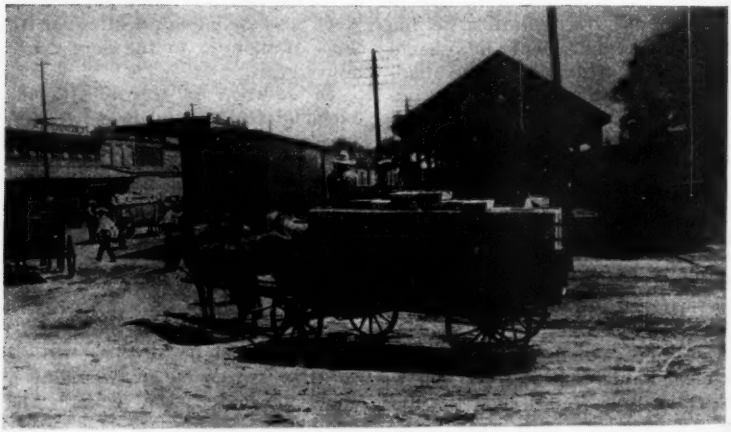
In getting ready for setting the plants, where the rows are bedded in late fall or early winter, they are rebedded in the spring, and where broken broadcast, double disked with a disc harrow. The rows are usually laid off four to five feet apart and the plants set from 2½ to three feet apart in the drill.

Tomato growers long ago learned that to get the best and most fruit and the earliest fruit, liberal quantities of a high-grade complete fertilizer must be used. A few hundred pounds per acre will not give the desired results. It takes from 1,000 to 1,500 or more to do the work.

Some like one analysis and some another, but one thing that all tomato growers seem pretty well agreed upon is that a liberal amount of high-grade fertilizer must be used. Especially is this true of potash. Unless a liberal amount of potash is used, puffs will usually form, the skin will crack open, and the tomato will not carry well.

A puff on a tomato is an unfilled space between the skin and the fruit proper. Many growers say that they can tell by glancing at the tomatoes in the packing shed whether or not they were fertilized with a liberal amount of potash as those that do not get much potash will invariably show a heavy per cent of puffs and lack a certain firmness and color.

The matter of puffs in tomatoes is a rather serious one, because a puffed tomato will not reach the market in good condition.



Hundreds of "juicy salads" on their way North

Also when a small per cent of potash is used, the stem end of the tomato cracks open more readily than where heavy amounts are used. The potash seems to toughen the stem and to a very large extent, prevent the cracking.

The average analysis used by most of the growers is an 8-4-6, although some use an 8-4-4, some 12-4-4, some 10-4-4, and some 10-4-6.* It seems rather definitely proven that 6 per cent is the minimum amount of potash that should be used. In the southern part of Texas in the Rio Grande Valley, tests have shown that 8 per cent potash should be used.

Only a comparatively small amount of nitrogen is needed in that territory, because the land is still quite rich in nitrogen. The formula that most of the growers in the Rio Grande Valley use is an 8-2½-8.

The proper firmness and carrying qualities, say the growers of the Rio Grande Valley, is not assured unless a heavy percentage of potash is used. Probably the 8-4-6 is about the standard average analysis used by the leading tomato growers over the whole South.

In addition to applying all the way from 1,000 to 2,000 pounds of this high-grade complete fertilizer, many of the most successful growers give a side application of nitrate of soda or sulphate of ammonia. Some prefer to give all of this material in one side application and others prefer two.

When two are used, many of the growers give the first application about the time the bloom buds begin to appear, and the second when the largest tomatoes are about the size of marbles. From 75 to 100 pounds per acre is applied where two applications are given—usually 100 to 150 pounds where only one side application is given.

The growers who advocate the one side application state that by giving it soon after the plants have been transplanted and started growth, far better results are secured from 100 to 125 pounds than can be secured from 150 to 175 pounds, applied after the fruit has commenced to form.

There is much evidence to support the contention of those who believe that all of this readily available nitrogenous fertilizer should be given early in one side application.

Cotton growers used to think that the nitrate of soda or sulphate of ammonia should not be applied until fruiting started, but it is generally conceded now that this is too late, and that usually best results are secured from a side dressing, if given the cotton immediately after it is up and growing well.

The same general principle seems to apply to tomatoes, and it is clear that those growers who believe in the method of applying it soon after the plants are set out and started to growing are on the right track.

Year in and year out the early tomato industry in the South is a very profitable one. Of course when there is an over-production, there is a heavy loss, but by studying the situation carefully, the growers are avoiding over-production better than formerly. It is a highly specialized business and one in which many things are necessary and the two most important seem to be brains and fertilizer.

* (The percentages are stated in the following order: phosphoric acid, nitrogen, potash.)

* * * * * * *

Teacher—Willie, what is an "average?"

Willie—It's something a hen lays on.

Teacher—Explain, please.

Willie—Well, I can't explain it—but I know our old Leghorn hen lays on an average of three eggs a week.

500 Grape Vines Earn $805.40

(*From page* 17)

I believe the failure was caused mostly by neglect and lack of disease control. Anyway the concensus of opinion was that I was a 'darn fool' for trying to grow grapes in that section after they had already proved to be a failure.

"But I took courage after further investigation on my part and in January of 1922 I decided to put out my first grapes.

"First, I selected an acre of land on a slight slope. The land was a sandy loam about 8 inches deep with a clay subsoil that afforded good drainage.

"However, grape growing does not depend so much on soil or climate, it rests mostly with the individual. Grapes require closer attention than any other horticultural crop, but the returns are also greater. For example, you can't delay a week and put on a spray and expect to get results. Pruning must be done at the right time and in the proper way.

"I made my first planting in January, 1922. As stated above, I started out with one acre, planting the following varieties, Brighton 125, Delaware 125, Concord 125, Niagara 125. The 500 vines were purchased from a first-class nursery and cost me $60, the fertilizer cost $50. The cultivation, staking, tying, posts, and wire cost $60.

Mr. Atkinson states the cost of production for one acre usually runs from $75 to $100 after the vines begin to bear. This does not include the cost of marketing and harvesting which are standard costs. Harvesting cost of course depends on the yield.

Mr. Atkinson continued the story by saying: "I fertilize my grapes well and cultivate thoroughly and often; these two factors go a long way to success with grapes.

"Grapes should not be planted over 8 feet apart in rows and rows should be 10 feet wide, rows should be wide enough apart to drive a wagon between them.

"After the grapes begin to bear I use a standard fertilizer consisting of 600 pounds of 9-3-3 and 200 pounds of nitrate of soda per acre. In addition I broadcast 16 tons of lot manure to an acre. I also plant two cover crops, peas in summer and rye and vetch or oats and vetch in winter. The manure and the cover crops provide humus which helps to conserve water supply as well as enriching the soil. During the severe drouth this season I would not have made anything without the humus in the soil which conserved the water for the crop.

"Beginning in the spring I plow through my grapes once a week during the harvesting season, using a special grape hoe, which is a one-horse implement. By using this hoe I save much time and labor. I bought the first grape hoe sold as far south as Atlanta.

"My grapes come in before California grapes," says Mr. Atkinson, "which is another advantage we have in Dixie in getting to the big eastern markets first. The harvest season with me usually runs about two weeks."

TWO-QUART baskets are used by the Atkinsons and 12 baskets are packed in a crate. A label is stuck on every basket to remind people where they can get more grapes of the same kind and quality.

Since the first year the Atkinsons haven't been able to supply

the demand. After the first year they did not try to sell the grapes, because they were selling themselves and the big demand could not be supplied. The first year it was very hard to sell 1000 pounds of grapes, the next 6000 pounds were sold on the same market. In 1925 Mr. Atkinson states that he sold out before he knew it and that the demand was so great he could have sold the grapes from 10 acres instead of one. The grapes were properly harvested, graded, packed and labeled, the result being a quality product that sold itself.

"The people must be educated to eat grapes," says Mr. Atkinson. "It is best to start with 1 or 2 acres at first and get the trade built up. Community plantings of several acres and cooperative shipments is another fine way to get started.

"Beverages made from grapes offer a wonderful market that has not been developed in the South—it offers a big opportunity. We have had hundreds of visitors in our vineyard and we sell a large quantity of our grapes at the packing shed."

Mr. Atkinson says the possibilities for the average Southern farmer with 1 or 2 acres of grapes is good. The Tryon section in North Carolina started growing grapes 25 years ago and they have developed a good market for grapes in commercial quantities. It was in Tryon that Mr. Atkinson first became interested in growing grapes. He got his information first hand and then he tried it out himself and he has just started in the business, he says.

Already Mr. Atkinson has received calls from all over the South asking for his aid in helping to establish grape vineyards.

In three years the Atkinsons have sold $2,028 worth of fruit from 1½ acres consisting of 1 acre of grapes and ½ acre of home orchard.

The Atkinsons believe in diversification, for besides growing cotton and general farm crops they have five acres in pecans and 10 acres in pears,—but the grapes paid better than anything.

This is what good fertilizer helped to do on a single grape vine

400 Bushel Potato Club

(*From page 21*)

crop in addition to his regular farm rotation of corn, oats, wheat and hay. At first his yields were only average. Some years he would make some money and others he would lose. It was not until Dr. Nixon came to Pennsylvania and Mr. Denniston heard his lectures and became one of his disciples that any real progress was made.

His first improvement was in certified seed, then spraying and more spraying, then better preparation of the seed-bed, better cultivation and added and more intelligent fertilization all of which culminated this year in their 441 bushel yield on an acre.

The soil this record yield was made on was a sandy clay loam, well-drained and sloping to the south. For the past 30 years it has produced clover every three years in the rotation. Two years ago it received 12 loads of manure on the wheat and again last year the same amount on the clover.

This made an extremely heavy sod, especially since they allowed the second growth to lie on the ground to be plowed under this Spring. Plowing was done early in the Spring to a depth of eight inches.

In the section where the Dennistons live the market pays the best prices for the potatoes that are marketed earliest.

Knowing this, the Dennistons wanted to plant as early as possible and hurry the crop along. So planting was done April 20 at a depth of several inches below the top level of the ground.

However, the seed was covered lightly in order that the sun would warm it and cause it to sprout quickly. Two harrowings were made with a smoothing harrow as the sprouts were growing. Then once again the smoothing harrow was used after the potatoes were up.

Not only were the Dennistons gratified at passing the 400-bushel mark, but they were extremely well pleased at the financial returns from this acre. Mr. Denniston has built up such a reputation for quality in his potatoes that they practically sell themselves. Three hotels, five restaurants, and three stores all use nothing but Denniston's potatoes when they can get them.

The price ranged from $2.25 per bushel on August 24 to $1.50 an August 31. The total crop brought $710.69. The total cost of raising including seed, fertilizer, spraying, etc., was $93.58, leaving a total net profit of $617.11 for the one acre.

In addition to these workings, the weeder was used once, the sulky worker once; there was one complete working with a one-horse cultivator, then four workings were made in every other row with the one-horse cultivator in order to clear a way for the wheels of the sprayer.

Three years ago on this same ground, they had a yield of 325 bushels per acre and the only reason they could see that they did not reach the 400 mark that year was because they did not plant thick enough. So this year 24 bushels per acre were planted in rows 30 inches apart and 12 inches apart in the row.

Fourteen-hundred pounds of fertilizer per acre are not uncommon applications in Maine, but in this section it was unheard of until the Dennistons tried it. An 0-12-6 grade was used. Nine hundred pounds were applied with a grain drill before planting and 500 more at time of planting.

The Kingdom of the Blind

(*From page 6*)

They heard the dull thud of dropping "windfalls" with half an ear —with half an eye they saw the ripe fruit drop from boughs to ground. It never occurred to any one of the millions on this earth to ask: "Why should the apples always fall downward, never upward?"

Newton saw the apple fall—and as it struck the ground he was struck with a great question. Out of his ratiocination came the accepted law of gravity. Newton looked, and saw, and *understood.*

A later Newton, friend of mine, lived on Fordham Road in the Bronx, New York City. He owned a two-family home of the type common enough in that district.

WHEN the Florida ballyhoo hit the nation this later Newton "saw" his big chance. He would sell the Bronx two-family and point the flivver's nose due south, returning, of course, as they all do in the movies, in a Rolls-Royce.

Newton went—and is back. What happened I will not relate. Like the Baptist who was asked whether he would prefer Heaven or Hell after death: "I have friends in both places,"—both in Florida and the Bronx.

But what this 1925 Newton did *not* see as he *looked* over the Florida literature prior to his southern flivver-jaunt was this: that while Miami had been increasing from 5,000 to 50,000 people the Bronx had increased from 80,000 to 1,000,000 people; that although lots on the Main street in Miami had, in ten years, increased in value from $15,000 to $100,000, similar lots in the Bronx had increased from $5,000 to $125,000 in the same decade!

He was too close to his own native Bronx to see and understand what was going on right under his nose—Florida's swamps, like distant pastures, looked greener. *The house he sold in the Bronx for $20,000 was worth $40,000 on his return from Florida!*

Henry Ford, at the beginning of this century, was no closer to the automobile of today than were dozens of others equally gifted men. Each saw in the "gas buggy" only a marvelous new contraption for which folks would pay good money.

The first year or two of popular acceptance of the automobile proved that self-propelled vehicles had a great future. Hundreds went into the game.

But Ford *looked*—and *saw* what the others were too blind to see: that, while in the beginning folks would buy cars for pleasure and the thrill, the real opportunity lay in providing transportation.

Henry clearly saw that while people would pay any price for pleasure they would buy transportation upon a price and reliability basis—and that for every seeker after expensive pleasure there would be a thousand willing to buy inexpensive transportation.

In the kingdom of blind carmakers, Ford, though many may claim he is one-eyed mentally, is easily King.

"ORIGINALITY," said T. W. Higginson, "is simply a pair of fresh eyes."

In a world where admittedly there is nothing new under the sun, the big prizes are distributed to those who can look at an old

proposition with fresh eyes—who can bring to bear on a hackneyed subject the impress of a virgin mind.

No subject is ever fully covered. No thought ever fully completed. No idea is ever worked out to its fullest. Completion is stagnation. There is a new and undiscovered facet on every diamond, and a new side to every philosophy.

ORIGINALITY is the ability to look and see and know—to find the undiscovered; to poke in the cast-off rubbish heap of the world for sparkling bits of newness which can be set in lustrous, modern settings and presented as original.

He is most original—in this Kingdom of the Blind—who can see the thing as it is, cock his eye at it, then close his mind, walk away to think, *and return with a new idea!*

This walking away is an important part of the formula. Most of us are too close to our own petty subjects—we lack the outside viewpoint. We can gain this fresh outlook only by going away for a long enough time so that we are strangers when we return to the subject and thus view it through a stranger's eye.

Every man should leave his wife for a month every year; every business man should cut clean from his desk for many weeks; every student should lock up his books; and every writer should occasionally push aside his manuscript and take it on the wing for parts unknown.

Upon returning, it is marvelous with what fresh eyes we view our former works and associates. Our "blind-spot" is gone.

The real value of a vacation lies not in the rest supposedly gained but in the renewed interest and viewpoint which comes with the returning.

Our blind eyes can see again for a time. Work fast! For blindness again steals in and we become helpless as before.

At this season it is well to remain away from your most cherished plan for a while. Come back to it with new eyes. Let it be seen for what it is worth. Analyze it in comparison with other similar projects. Compare its worth. Value it. Dig into it. Look at it—and *see* it.

Then examine yourself. See yourself as a stranger might view you. Look yourself over physically. Peer into a mirror, a cheval glass, if possible.

Test your mental progress of the last year. Be fair; be honest; be square—but do not be easy on yourself. Be critical. Do as a stranger would. Get away and take a squint at yourself—*see* yourself as others see you.

How do the man and his work "stack up"? You—and your job? You—and your contribution to posterity? You—and your cherished ambition? How about it? Be honest!

This inability to see, so common among the citizens of the Kingdom of the Blind, often creates odd situations.

I know one citizen who, upon closely examining himself, admitted that he "might be in a rut"! You see what partial blindness does to one's vision! The fact was that the rut he was in had so gradually deepened and widened and lengthened that he could no longer see over its edge.

It was a *grave!*

Who was he?

I'll mention no names! Have you a mirror?

* * *

The world has need for just two kinds of workers—those who can do a job without being told, and those who can do it after they are told.

CLEAN Seed Means BETTER Grain Crops

A GOOD fanning mill is a prerequisite to good farming, says E. W. Hardies, assistant professor of Agronomy at South Dakota State College. He urges every farmer to make sure that all seed sown next spring is faultlessly clean.

If there is a fanning mill on the farm, seed can be cleaned this winter at times when it is almost impossible to do outside work. The time spent in running seed through the fanning mill will more than pay for itself in a cleaner and larger crop that can be handled more economically and will bring a better market price.

PURE, clean seed, means seed free from other grains, weed seeds, dirt and chaff. Records given by the seed inspection service of the United States Department of Agriculture show that the states of South Dakota, North Dakota and Minnesota produce annually almost 5,000,000 bushels of foreign material in their wheat crops alone. This is a large economic waste which effects both the farmer and the country elevator. It reduces yields, increases the cost of harvesting and threshing, takes up space in the elevators and grain cars and costs just as much to ship to market as an equal amount of pure grain.

Where poor farming methods are used, the amount of foreign material is steadily increasing because of the impure seed used and the lack of proper rotation which will destroy many of the weeds. The largest per cent of the weeds found in grain crops were introduced through impure seed. Seed properly cleaned before planting and a good crop rotation will do much to reduce the amount of weed seeds and other impurities in the small grain crop.

* * *

Foreign and International Agriculture

(*From page* 40)

new variety free from contamination with other varieties.

When a promising strain is found at Weihenstephan it is increased at the college until enough has been grown to give it a real test. It is then sent to some large land owner to be further increased. A man from the college gives it regular inspection to see that the right kind of treatment and care is given.

If the variety proves to be satisfactory, the landowner has the privilege of buying the right to use the seed for a certain number of years. He may sell from this seed to any party he wishes. If he fails to disseminate it in a satisfactory manner, however, he may not be allowed to purchase other varieties as they are developed.

One thing quite noticeable about the results found at the station was the faith large farmers had in the value of the work. Nitter said that this was quite universal in Germany.

ECONOMY

NOW that the holidays are over it's as good a time as any to begin on that economy program you have thought about for so long. Economy is one of the things everybody does best when broke, and there's nothing like a holiday season to generate the proper conditions.

The first step is to make out a budget. Add up all your expenses for last year; subtract the cost of a new pair of collar buttons; add three new tires and a pair of skates for the kids; divide by the amount of all the sums you are apt to inherit during the coming year; and multiply by the cost of three tons of coal delivered in your cellar. The total represents the probable expense of operating a completely equipped home, wife, and flivver this season. If in doubt as to the accuracy of the estimate, add ten per cent.

The next step is to effect household economies of such a nature that all waste is eliminated and expenses cut to a minimum. This is very simple, but must be accomplished by the exercise of ingenuity. The following suggestions have been thoroughly tried out by this department and found to work as well as any others we can think of:

I

A patch for little Willie's pants may be made out of one of big sister's dresses. For a large patch it may be necessary to sew two dresses together.

II

Holes in stockings should be carefully preserved and installed in the next batch of doughnuts.

III

It is a mistake to throw away old five dollar bills. If carefully crumpled up, they make excellent stuffing for a new bed tick.

IV

Old noses which have become dulled by the use of too much powder are not completely ruined. Good furniture polish, well rubbed in, will often bring out that youthful luster again.

V

Doing without one meal a day will cut down the grocery bill a third. Doing without eating altogether will eliminate this irritating source of expense entirely.

VI

Pasteboard boxes from mail order houses may be worked up into shoes for the children by a skillful housewife. Odd-shaped fragments left over may be fried in lard and served for pancakes.

VII

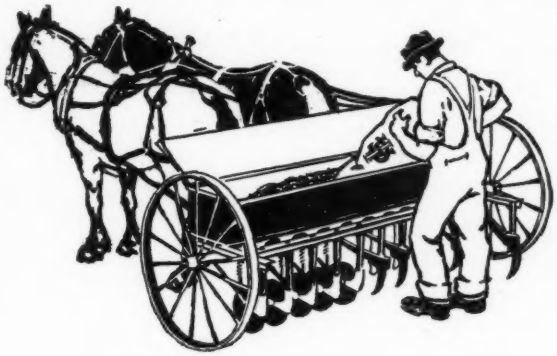
If the car needs new tires, buy a rubber plant and raise your own.

VIII

Unsightly tears or runs in black stockings may be defeated by painting the skin beneath with black ink.

* * *

January is the month when the fireside cornhuskers get in their very best work.



THROUGH MIXING

A fertilizer must be thoroughly mixed to drill easily without "lumping." If it's not properly prepared, a concentration of the ingredients in spots is likely to burn the plants.

International Fertilizers are safe—because the ingredients are mixed in the proper proportions—and mixed thoroughly. Modern mixing machinery, as used in International plants, is as far superior to the home-mixing equipment of the average farmer as the modern threshing machine is to the flail that Great-grandfather used.

Each bag of every shipment of two or more tons is carefully sampled by chemists at the time of shipment. This inspection insures quality in International Fertilizers.

INTERNATIONAL AGRICULTURAL CORPORATION
MANUFACTURERS OF HIGH GRADE FERTILIZERS

Dept. B, 61 Broadway, New York City

Sales Offices in Fifteen Cities

What does it cost you?

YOU may never know—it drains your profits like a leaking faucet and robs your plants of the yield that should be yours.

A few years ago, it carried away 4 to 5% of the total cotton crop and in some fields the destruction reached as high as 50%—cutting crops in half.

Many authorities agree that the most common causes of cotton rust are: lack of humus in the soil, poor drainage, and potash hunger. The better treatment you give your soil—the more you safeguard your income.

The United States Department of Agriculture, in Farmers' Bulletin 1187, recommends the following: " . . . supply vegetable matter to the soil. Use fertilizers containing potash. Drain the wet fields."

Put a little more time and care in the preparation of your soil—and don't guess with fertilizers. In the Bulletin mentioned above, the United States Department of Agriculture recommends: "The use of kainit at the rate of 200 lbs. per acre, or 50 lbs. per acre of muriate of potash, or the application of other potash-containing fertilizers . . ."

On this basis at least 600 pounds per acre of a high analysis complete fertilizer containing 4% potash, or 100 pounds if the potash content is 6%, are required to supply the necessary potash. If the losses from rust are heavy, larger applications per acre may be used to advantage.

POTASH IMPORTING CORPORATION OF AMERICA

10 Bridge Street, New York

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POTASH

PIC BRAND POTASH PAYS